

US EPA ARCHIVE DOCUMENT

# Stephen H. Schneider\*

Melvin and Joan Lane Professor for Interdisciplinary Environmental Studies,  
Professor, Department of Biological Sciences  
Senior fellow, Woods Institute for the Environment  
Stanford University

## *Mediarology: Communicating the seriousness of global warming without omitting the uncertainties*

Workshop on the Impacts of Climate Change on Air Quality in the Pacific  
Southwest

The Federal Building at 7th & Mission Streets  
San Francisco

October 11, 2007  
12:30pm -1:10pm

\*[Website for more info: [www.climatechange.net](http://www.climatechange.net).]

OCTOBER 19, 1987

\$1.95

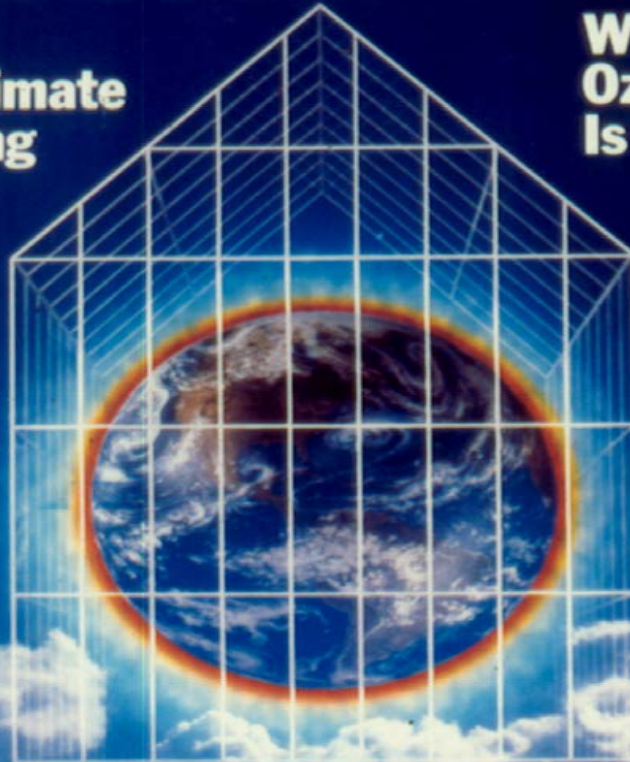
# TIME

**SPECIAL REPORT**  
**Fighting for**  
**Global**  
**Markets**

## The Heat Is On

**How the  
Earth's Climate  
Is Changing**

**Why the  
Ozone Hole  
Is Growing**



724406

EXCLUSIVE INTERVIEW: DUKAKIS ON SCIENCE

# DISCOVER

THE WORLD OF SCIENCE

OCTOBER 1988 \$2.50

## THE GREENHOUSE EFFECT

THIS SUMMER WAS  
MERELY A WARM-UP

DOLPHINS IN  
THE MILITARY

KRAKATAU: BACK  
FROM THE DEAD

DESIGNER  
PROTEINS



RESEARCH NEWS:  
The Real Temple of Doom  
Early Americans  
Rise of the Tetrapods





# DISCOVER

THE NEWSMAGAZINE OF SCIENCE

APRIL 1991

\$2.95

## EARTH ON ICE

A Bold Attack on Global Warming



VISIONARY CRAIG MCCAUL'S  
TOUGHEST TEST

HOW THE MAFIA  
MANIPULATES STOCKS

A GOLD-BACKED  
RUBLE?

THREE DOLLARS SEVENTY-FIVE CENTS

# Forbes

THE GLOBAL WARMING  
PANIC



A CLASSIC  
CASE OF  
OVERREACTION





JANUARY 2, 1989

No. 1

# PLANET OF THE YEAR

# TIME

INTERNATIONAL



## Endangered Earth

*Christie*  
1988

COMPLIMENTS  
OF  
GRAND HOTEL

INDONESIA  
LNG  
MALA  
MIR

NO. 10000  
\$15.00  
\$15.00  
\$15.00

INDONESIA  
MALAYSIA  
MALAYSIA  
MALAYSIA

NO. 10000  
\$15.00  
\$15.00  
\$15.00

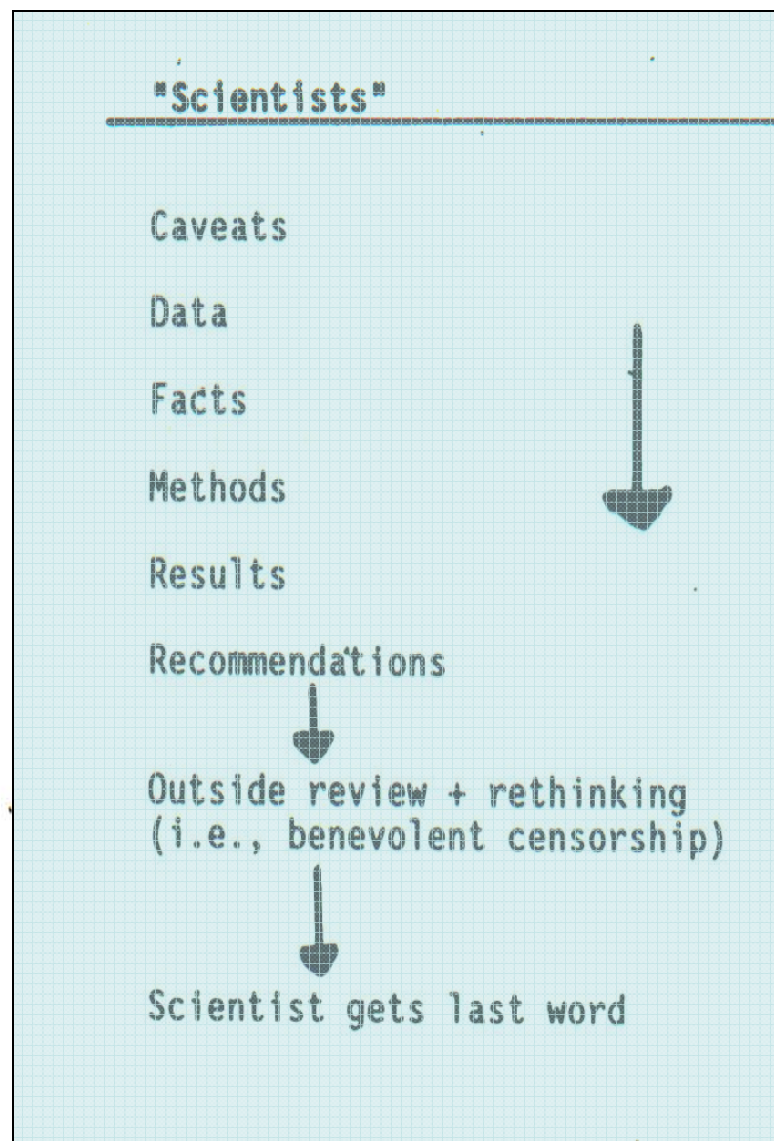
PAKISTAN  
PHILIPPINES  
SARAWAK  
SINGAPORE

\$15.00  
\$15.00  
\$15.00  
\$15.00

SRI LANKA  
TANZANIA  
THAILAND  
U.S. ARMED FORCES

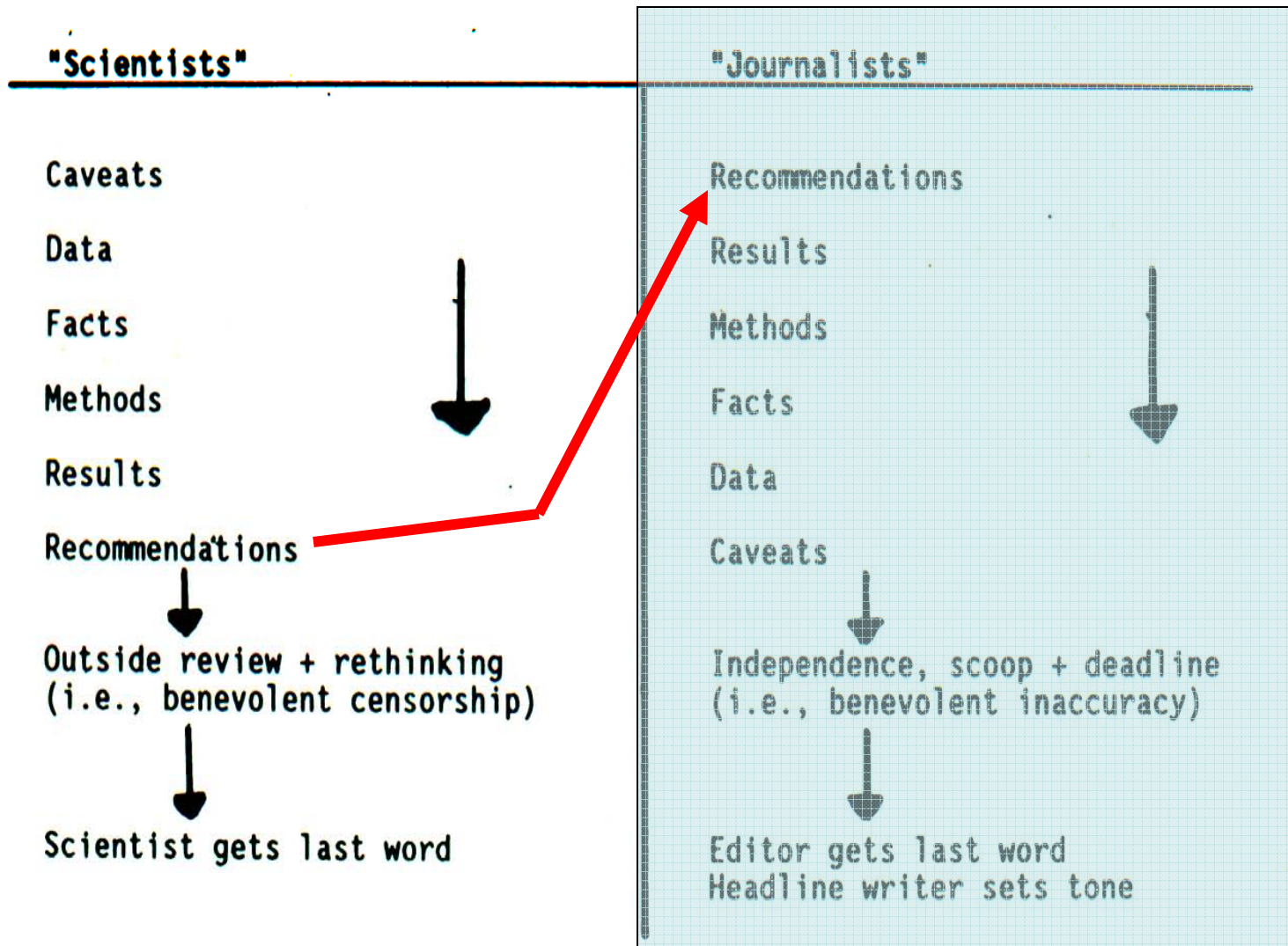
\$15.00  
\$15.00  
\$15.00  
\$15.00

## PRESENTATIONAL STYLES



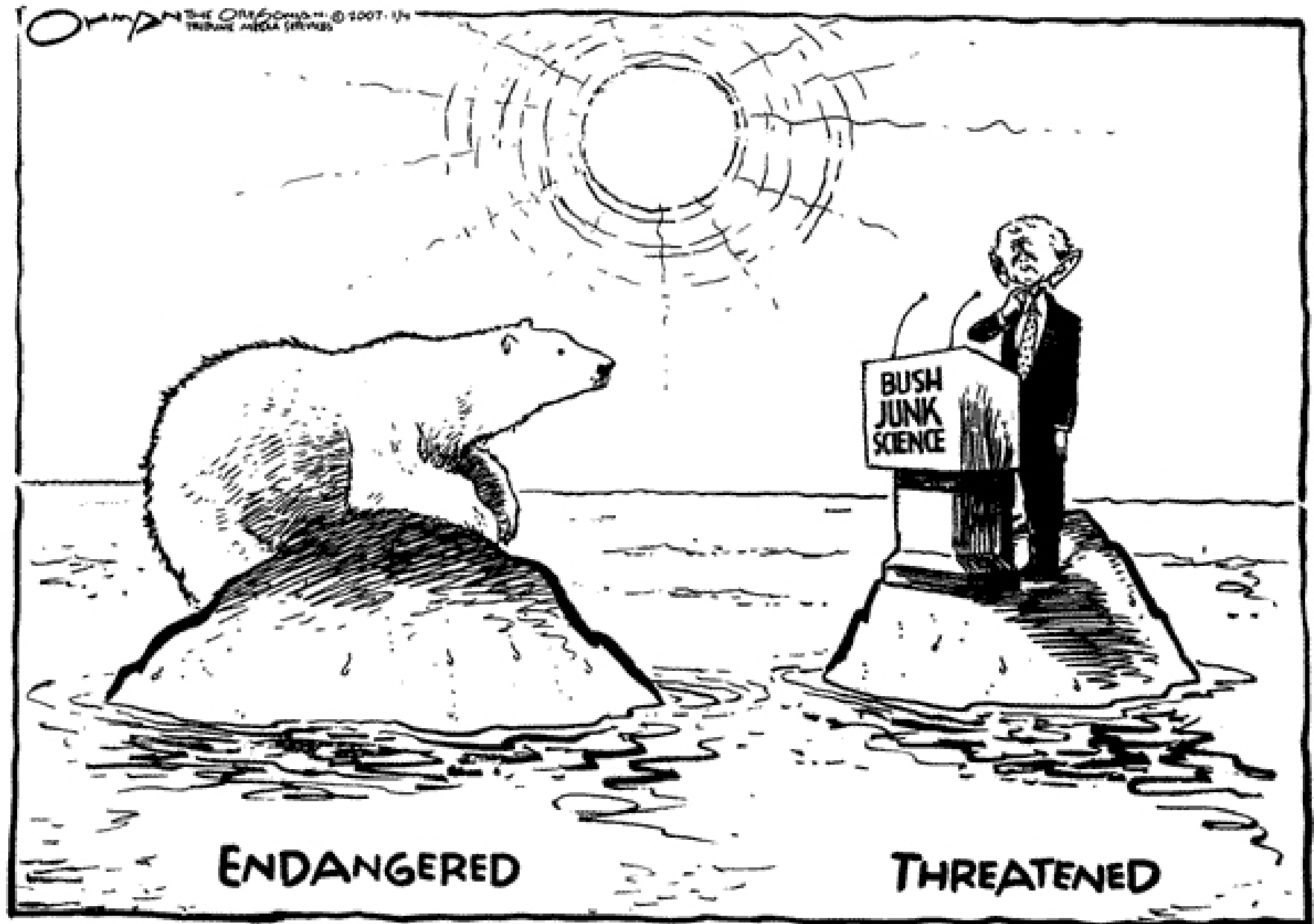


## PRESENTATIONAL STYLES





OMMAN THE OREGONIAN © 2007 JIN  
TRIDANE MEDIA SERVICES



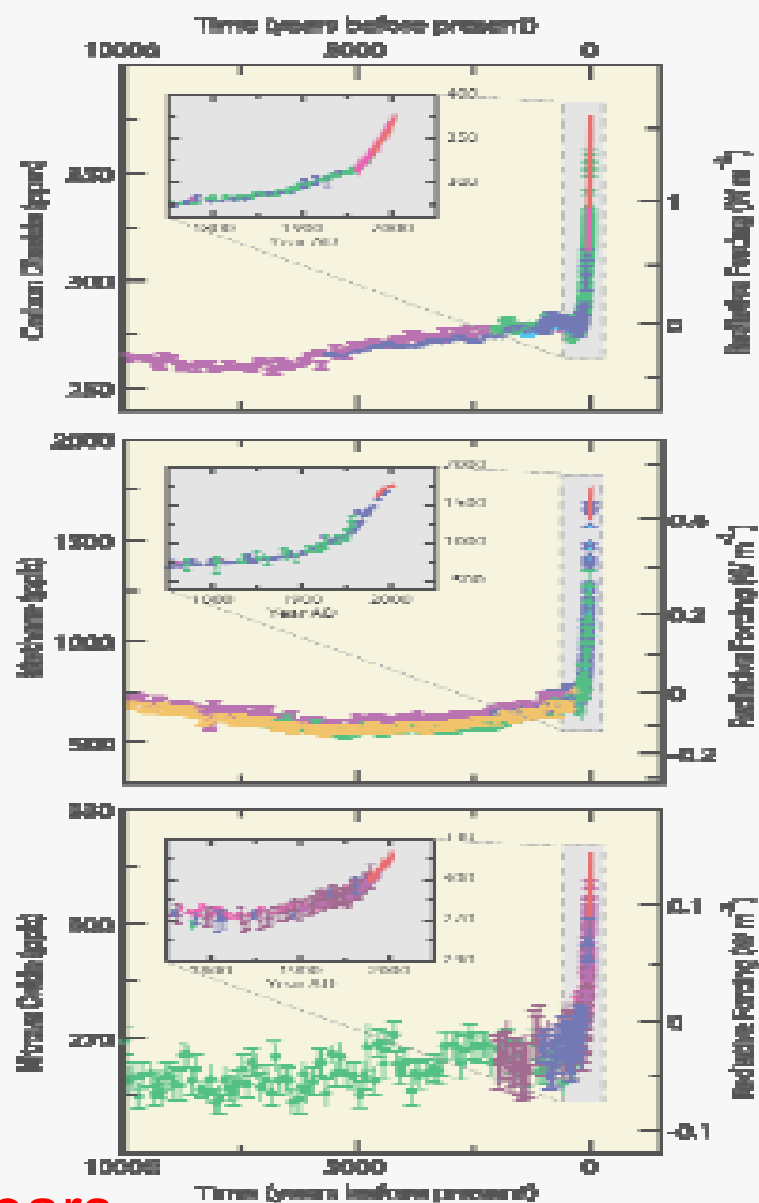


# Is the Science “Settled”?

CO<sub>2</sub>

CH<sub>4</sub>

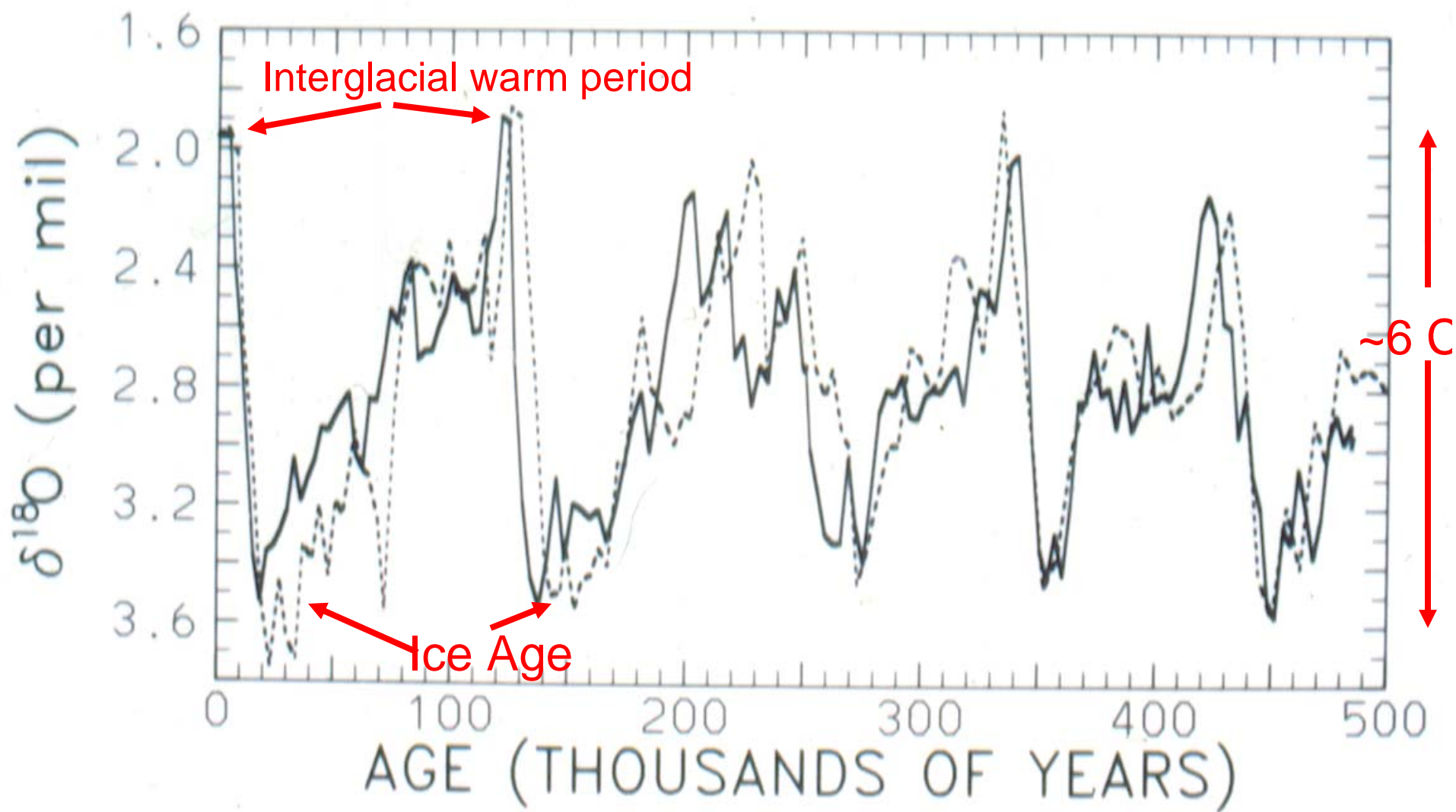
N<sub>2</sub>O



10,000 Years ← →

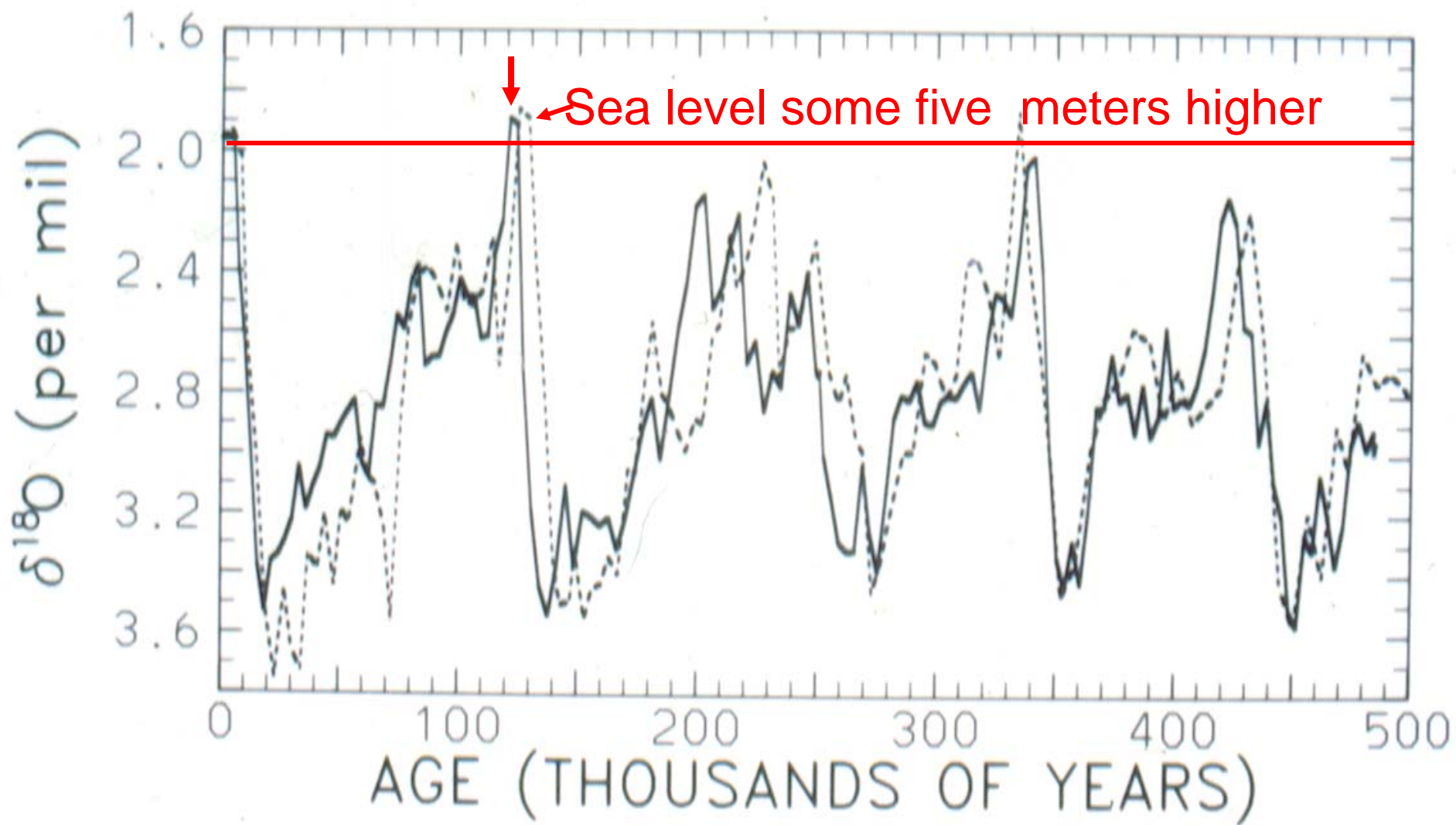
Figure 2.4. Atmospheric concentrations of carbon dioxide, methane and nitrous oxide over the last 10,000 years (large panels) and since 1750 (inset panels). Measurements are shown from ice cores (symbols with different colours for different studies) and atmospheric samples (lines). The corresponding radiative forcings are shown on the right hand axes of the large panels. [WGI Figure SPM-1]

## TIME SERIES





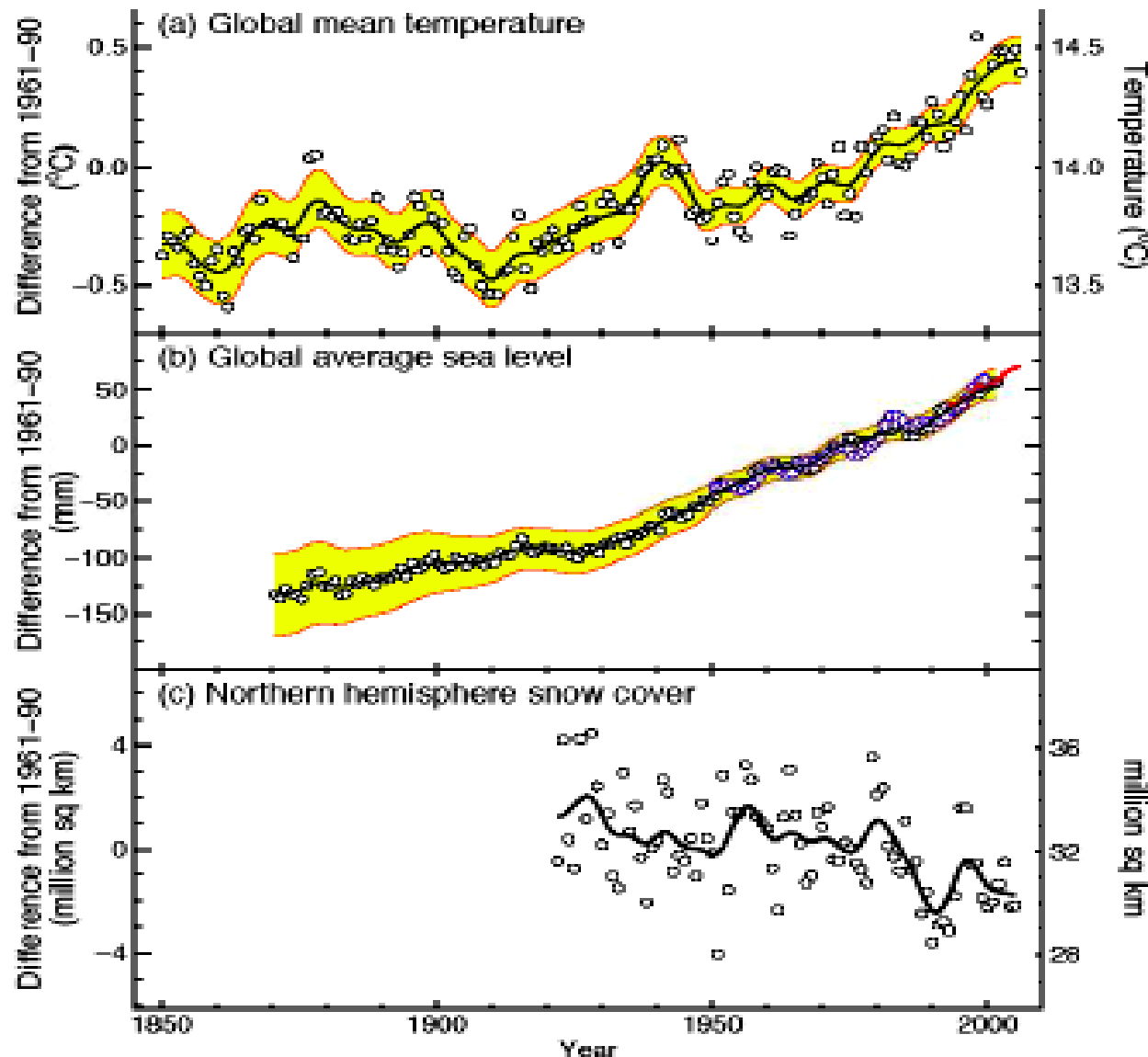
## TIME SERIES



## Global Warming is Happening NOW:

“Warming of the climate system is **unequivocal**, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global mean sea level (see Figure SPM-3). {3.2, 4.2, 5.5}.”

*IPCC, Summary for Policymakers, Contribution of Working Group I to the Fourth Assessment Report, February, 2007*



**Figure 1.1.** Changes in global mean temperature, sea level, and snow cover area. Panel (a) shows global mean temperatures as annual values (open circles) and a smoothed curve (black line) with uncertainty in the smoothed curve shown by the yellow shaded area. Panel (b) shows global mean sea level from tide gauge data (circles) and recent satellite measurements (red line). Panel (c) shows April Northern Hemisphere snow cover area each year (circles) with smoothed values (black line). [WGI Figure SPM-3]



## Global and continental temperature change

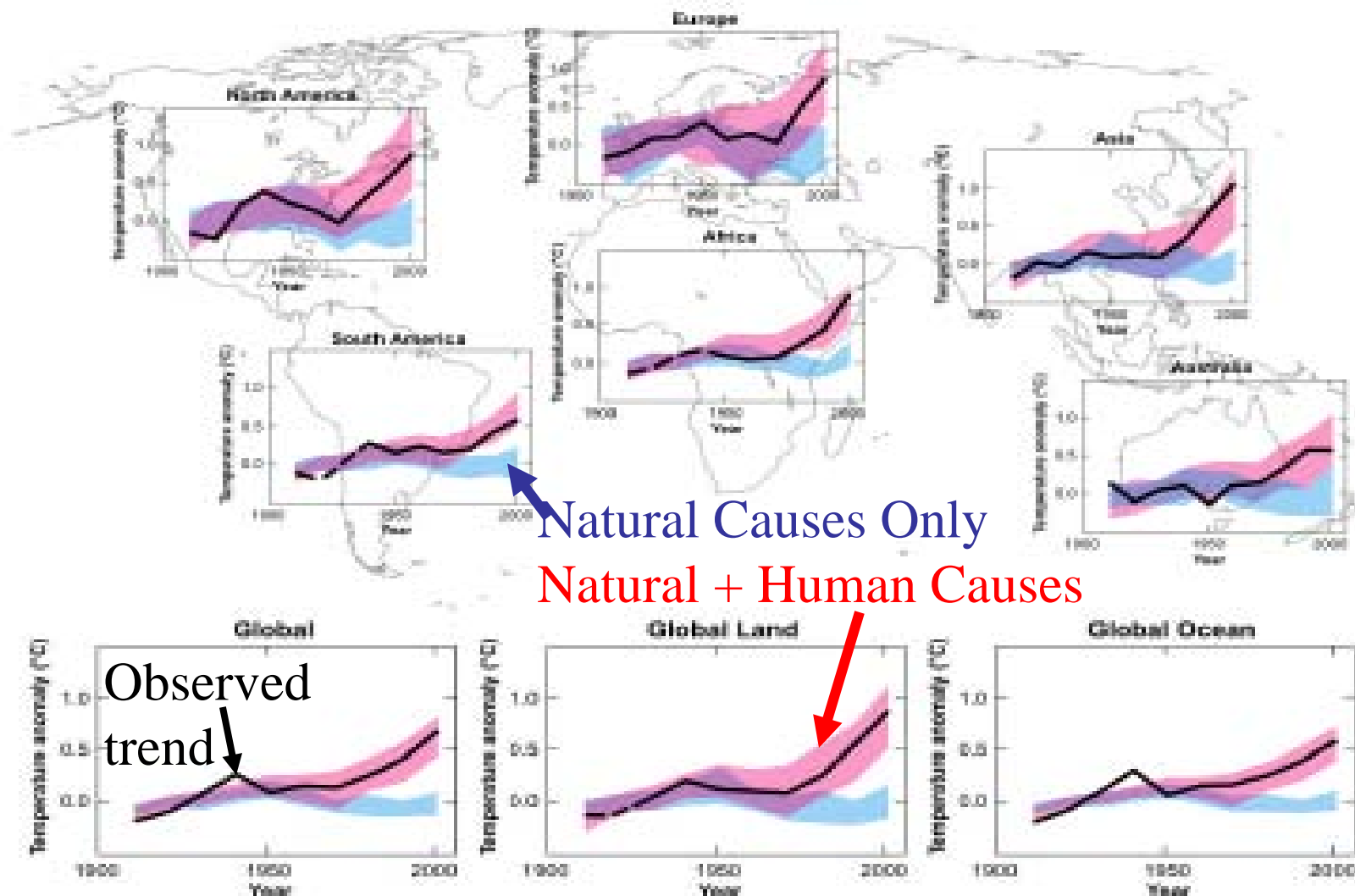


Figure SPM-4. Comparison of observed continental- and global-scale changes in surface temperature with results simulated by climate models using natural and anthropogenic forcings. Decadal averages of observations are shown for the period 1906-2005 (black line) plotted against the centre of the decade and relative to the corresponding average for the 1901-1950. Lines are dashed where spatial coverage is less than 50%. Blue shaded bands show the 5-95% range for 19 simulations from 5 climate models using only the natural forcings due to solar activity and volcanoes. Red shaded bands show the 5-95% range for 58 model simulations from 14 climate models using both natural and anthropogenic forcings. [Figure 2.5]

Munich Re:

“We need to stop this dangerous experiment humankind is conducting on the Earth’s atmosphere.”

Article 2 of the UN Framework Convention on Climate Change (UNFCCC) states that: “The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, **stabilization of greenhouse** gas concentrations in the atmosphere at a level that would prevent **dangerous anthropogenic interference** with the climate system”. The Framework Convention on Climate Change further suggests that “Such a level should be achieved **within a time frame** sufficient

- to allow ecosystems to adapt naturally to climate change,
- to ensure that food production is not threatened and
- to enable economic development to proceed in a sustainable manner.”



# “Dangerous” Climate Change

- Who decides what is “dangerous” in DAI?

# “Dangerous” Climate Change

Who decides what is “dangerous” in DAI?

Many ways to define DAI

Ultimately, not a scientific choice

# Climate Uncertainty

- Inherent uncertainty in projections of future climate

# Climate Uncertainty

- Inherent uncertainty in projections of future climate
- Best guess → Range



# Climate Uncertainty

- Inherent uncertainty in projections of future climate
- Best guess → Range\*

\*Climate Sensitivity: 1.5→4.5 C:  
Charney Report (1979) , IPCC (1996, 2001)

# Climate Uncertainty

- Inherent uncertainty in projections of future climate
- Best guess → Range\* → PDFs

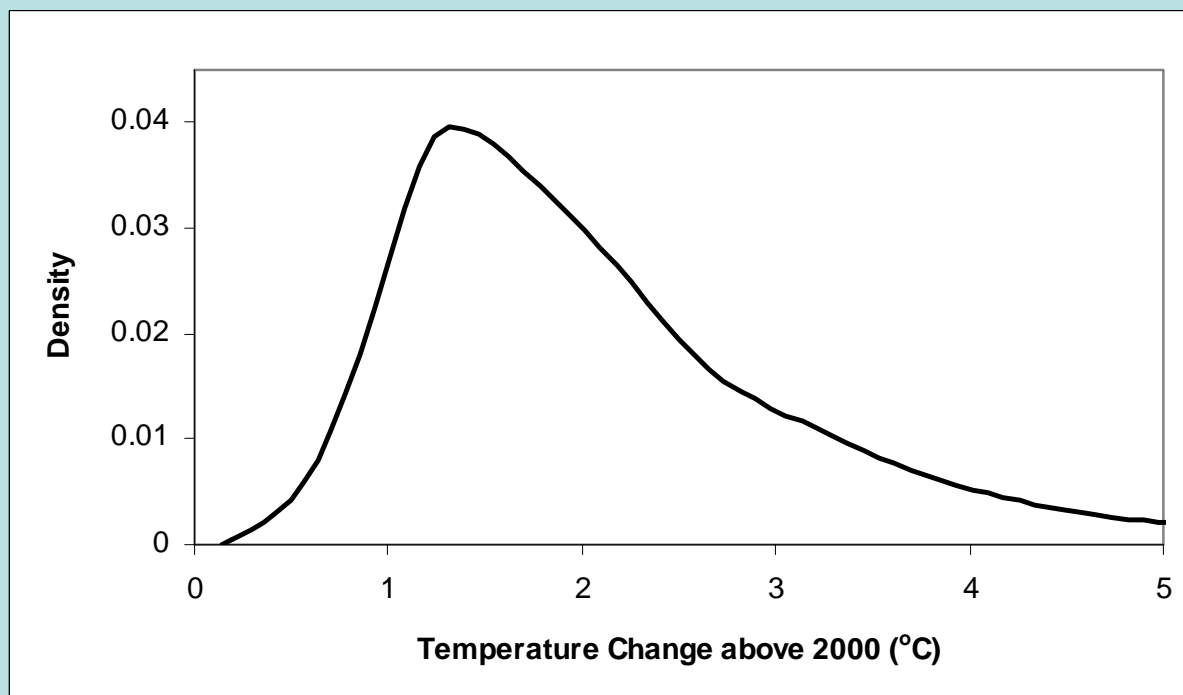
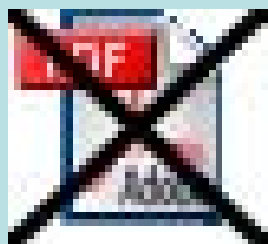
\*Climate Sensitivity: 1.5→4.5 C:

Charney Report (1979) , IPCC (1996, 2001)

# Climate Uncertainty

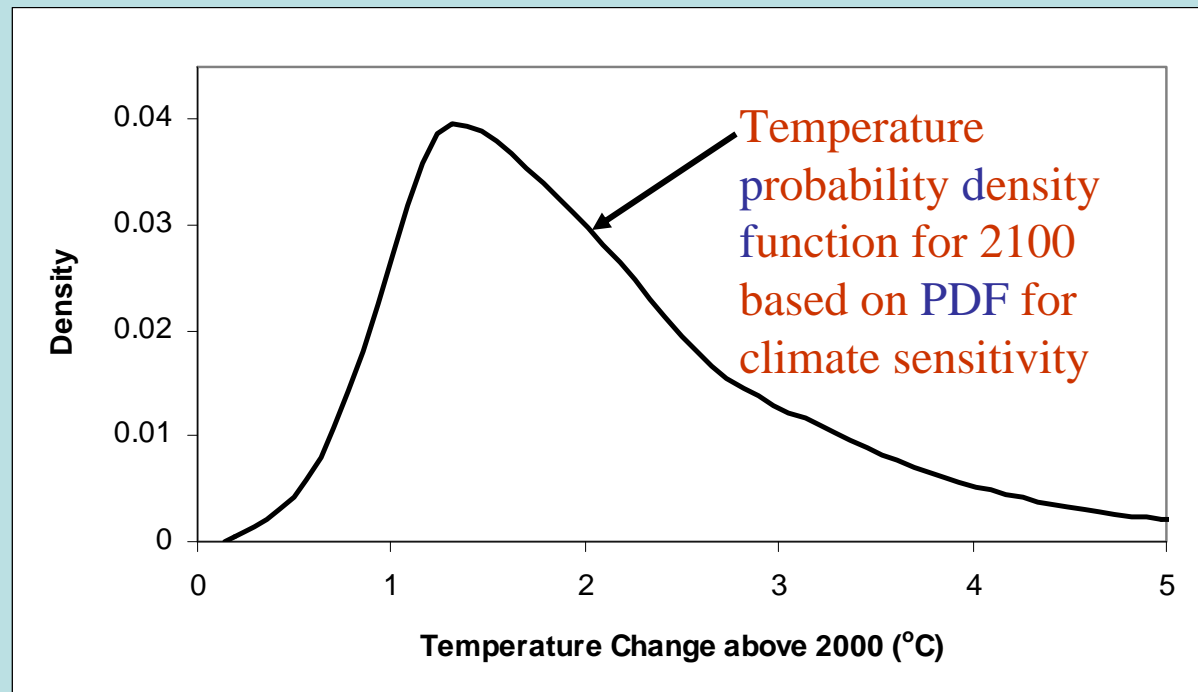


# Climate Uncertainty





# Climate Uncertainty



Most sensible decision paradigm?: Risk-management.

# Is the Science “Settled”?

# Double Ethical Bind:

\*full disclosure

# Double Ethical Bind:

- \*full disclosure

- \*be effective

# Double Ethical Bind:

\*full disclosure (in 20 second sound bites??!! @#\$???)

\*be effective



# Double Ethical Bind:

- \*full disclosure (in 20 second sound bites??!! @#\$??)
- \*be effective (need 20 second sound bites!)

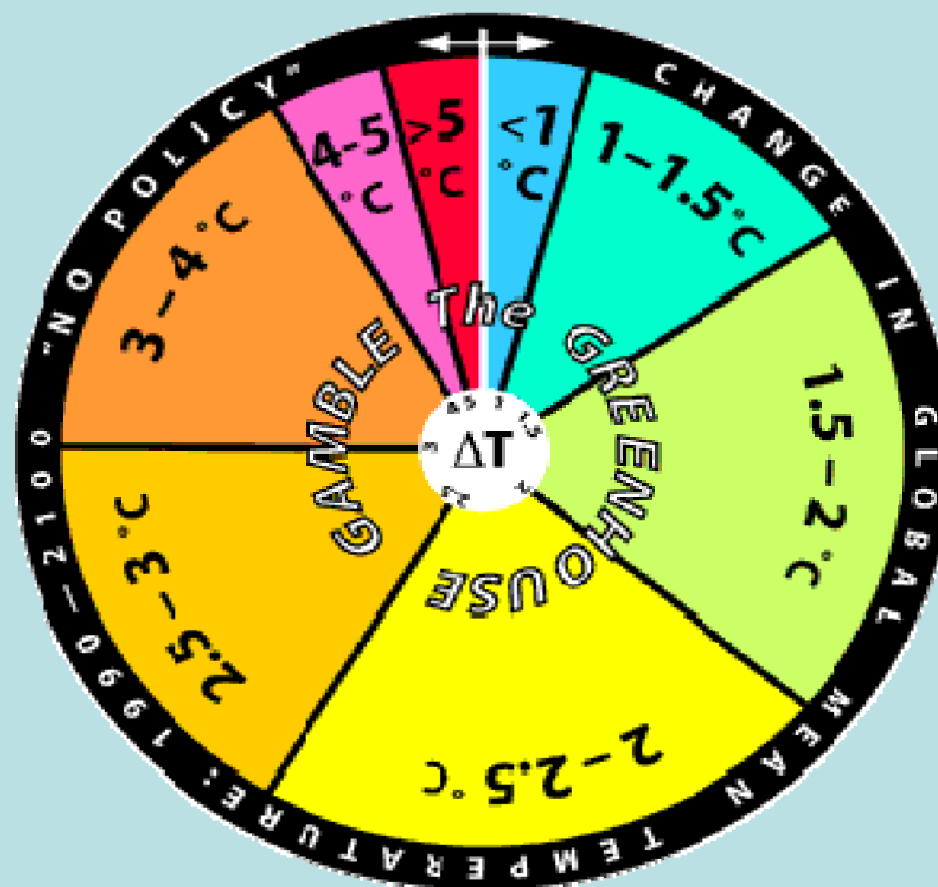
CAN WE 'SOLVE' THE "DOUBLE  
ETHICAL BIND" ?

CAN WE 'SOLVE' THE "DOUBLE  
ETHICAL BIND" ?

USE METAPHORS THAT CONVEY  
BOTH URGENCY **AND**  
UNCERTAINTY

# The great “greenhouse gamble” ...

<1°C	(4.1%; 1 in 24 odds)
1 to 1.5°C	(11.4%; 1 in 9 odds)
1.5 to 2°C	(20.6%; 1 in 5 odds)
2 to 2.5°C	(22.5%; 1 in 4 odds)
2.5 to 3°C	(16.8%; 1 in 6 odds)
3 to 4°C	(16.2%; 1 in 6 odds)
4 to 5°C	(4.6%; 1 in 22 odds)
>5°C	(3.8%; 1 in 26 odds)



Source: MIT Joint Program on the Science and Policy of Climate Change

# To Help Ensure Credibility (in Writing)\*

- Hierarchy of backup products:
    - Op-ed pieces
    - Longer popular articles
    - Books
- \* Explain how your views were modified with new evidence



# To Help Ensure Credibility (in Speaking)

- Hierarchy of backup products:
  - 15 second sound bites
  - 1 minute explanation
  - 10 minute talk
  - 50 minute lecture (sometimes more for some of us!)

# SCHNEIDER'S "THREE COMMANDMENTS" OF COMMUNICATION:

Know thy audience!

# SCHNEIDER'S "THREE COMMANDMENTS" OF COMMUNICATION:

Know thy audience!

Know thy self!

# SCHNEIDER'S "THREE COMMANDMENTS" OF COMMUNICATION:

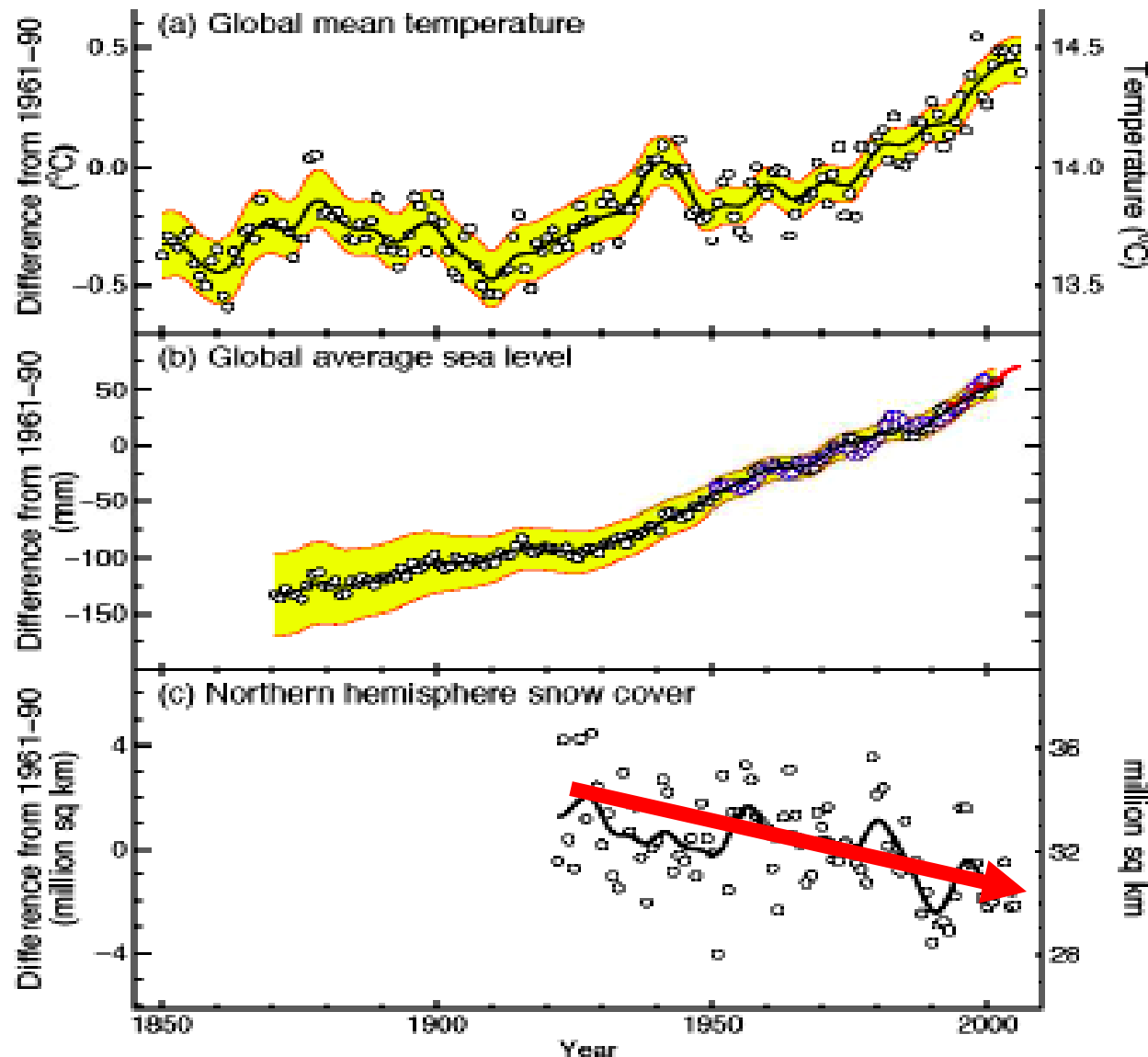
Know thy audience!

Know thy self!

Know thy stuff!

# IMPACTS:

## A Brief Litany



**Figure 1.1. Changes in global mean temperature, sea level, and snow cover area.** Panel (a) shows global mean temperatures as annual values (open circles) and a smoothed curve (black line) with uncertainty in the smoothed curve shown by the yellow shaded area. Panel (b) shows global mean sea level from tide gauge data (circles) and recent satellite measurements (red line). Panel (c) shows April Northern Hemisphere snow cover area each year (circles) with smoothed values (black line). [WGI Figure SPM-3]



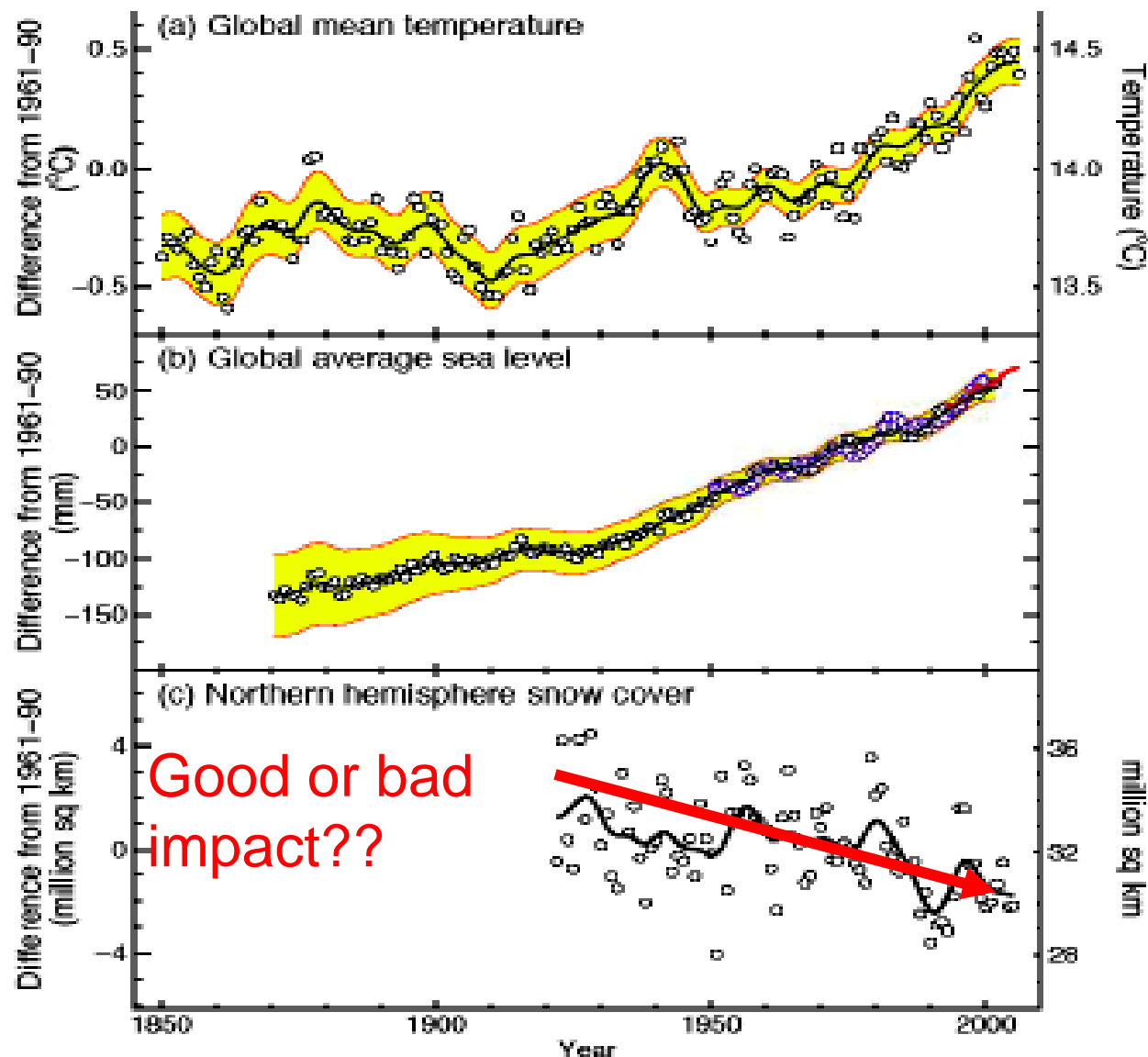
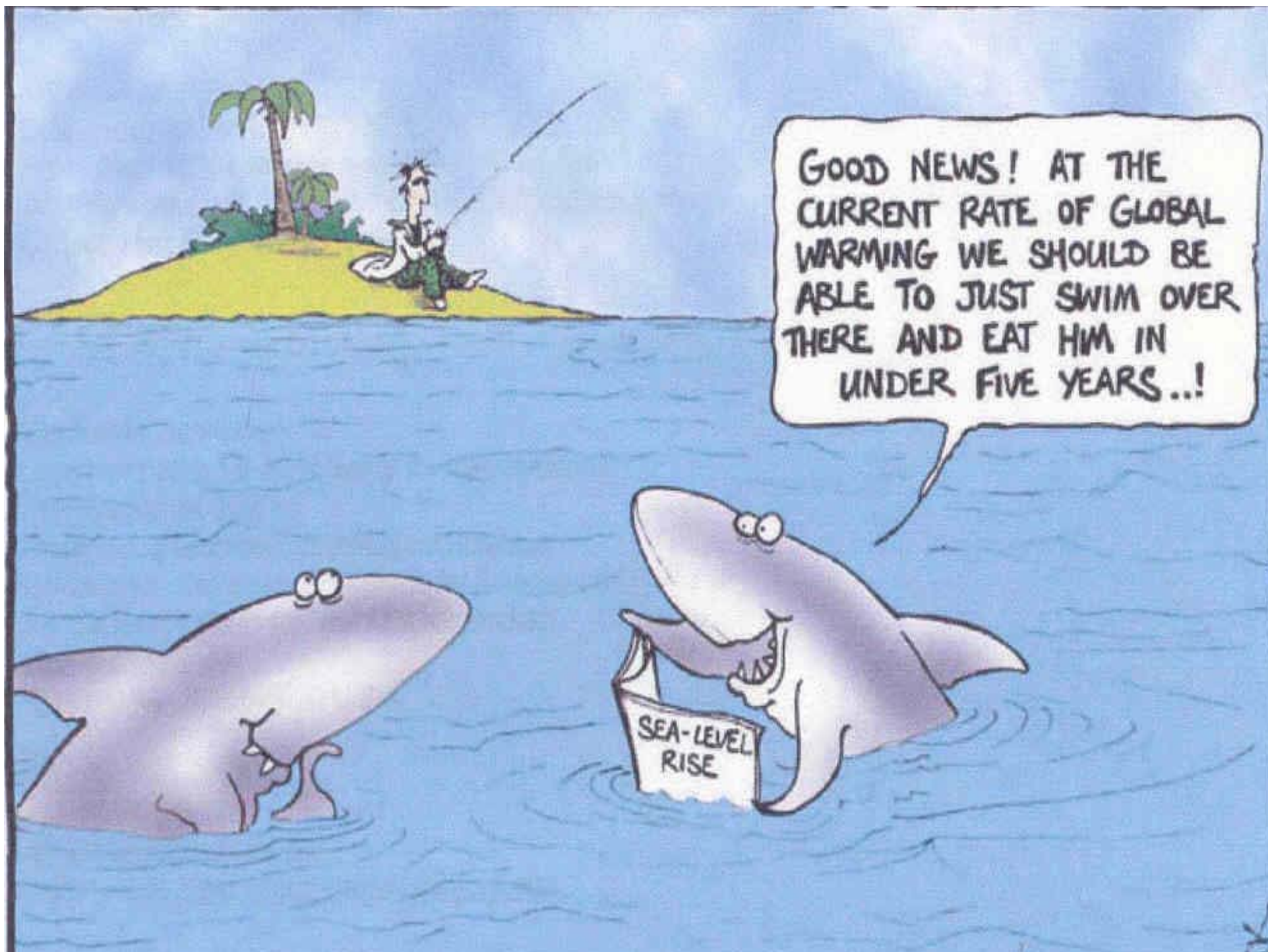


Figure 1.1. Changes in global mean temperature, sea level, and snow cover area. Panel (a) shows global mean temperatures as annual values (open circles) and a smoothed curve (black line) with uncertainty in the smoothed curve shown by the yellow shaded area. Panel (b) shows global mean sea level from tide gauge data (circles) and recent satellite measurements (red line). Panel (c) shows April Northern Hemisphere snow cover area each year (circles) with smoothed values (black line). [WGI Figure SPM-3]







# Inuit to file anti-U.S. climate petition

Wed Jun 15, 2005 11:09 AM

OSLO (Reuters) - Inuit hunters **threatened by a melting of the Arctic ice** plan to file a petition accusing Washington of **violating their human rights by fueling global warming**, an Inuit leader said Wednesday.

Sheila Watt-Cloutier, chair of the Inuit Circumpolar Conference (ICC), also said Washington was hindering work to follow up a 2004 report by 250 scientists that said the thaw could make the Arctic Ocean ice-free in summer by 2100.

Watt-Cloutier, in Oslo to receive an environmental prize, said the inuits' planned petition to the 34-member Organization of American States (OAS) could put pressure on the United States to do more to cut industrial emissions of heat-trapping gases.

"It's still in the works, the drafting is still going on," she said of a long-planned petition to the OAS' human rights arm, the Inter-

American Commission on Human Rights.

**PAGE ONE**

## **The Ukukus Wonder Why a Sacred Glacier Melts in Peru's Andes**

**It Could Portend World's End,  
So Mountain Worshipers  
Are Stewarding the Ice**

**By ANTONIO REGALADO**  
Staff Reporter of THE WALL STREET JOURNAL  
*June 17, 2005; Page A1*



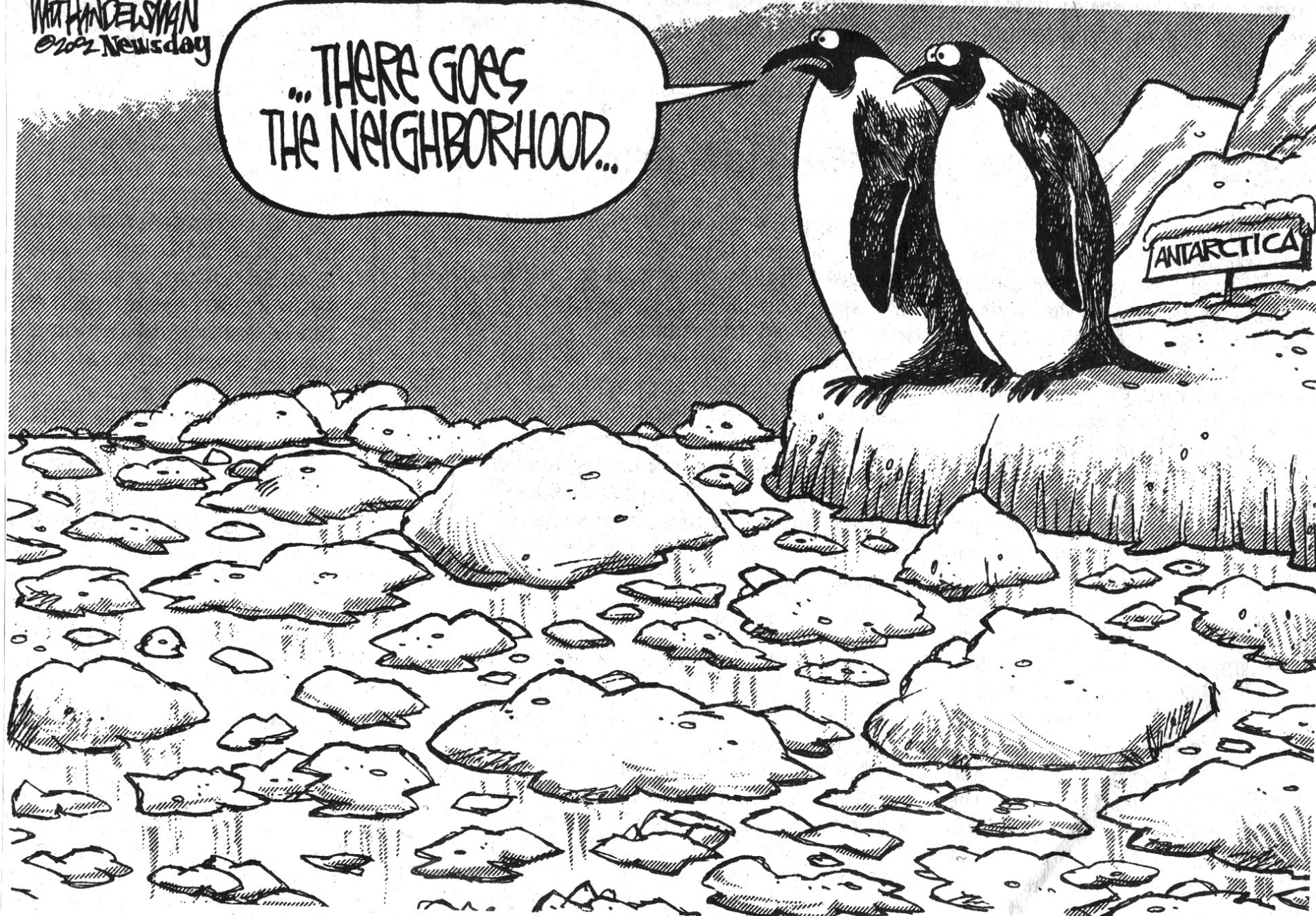
Vicente Revilla/BMCC-CUNY

An ukuku hauls a block of mountain ice near Cuzco, Peru, in 1999. The tradition is disappearing along with Peru's glaciers.

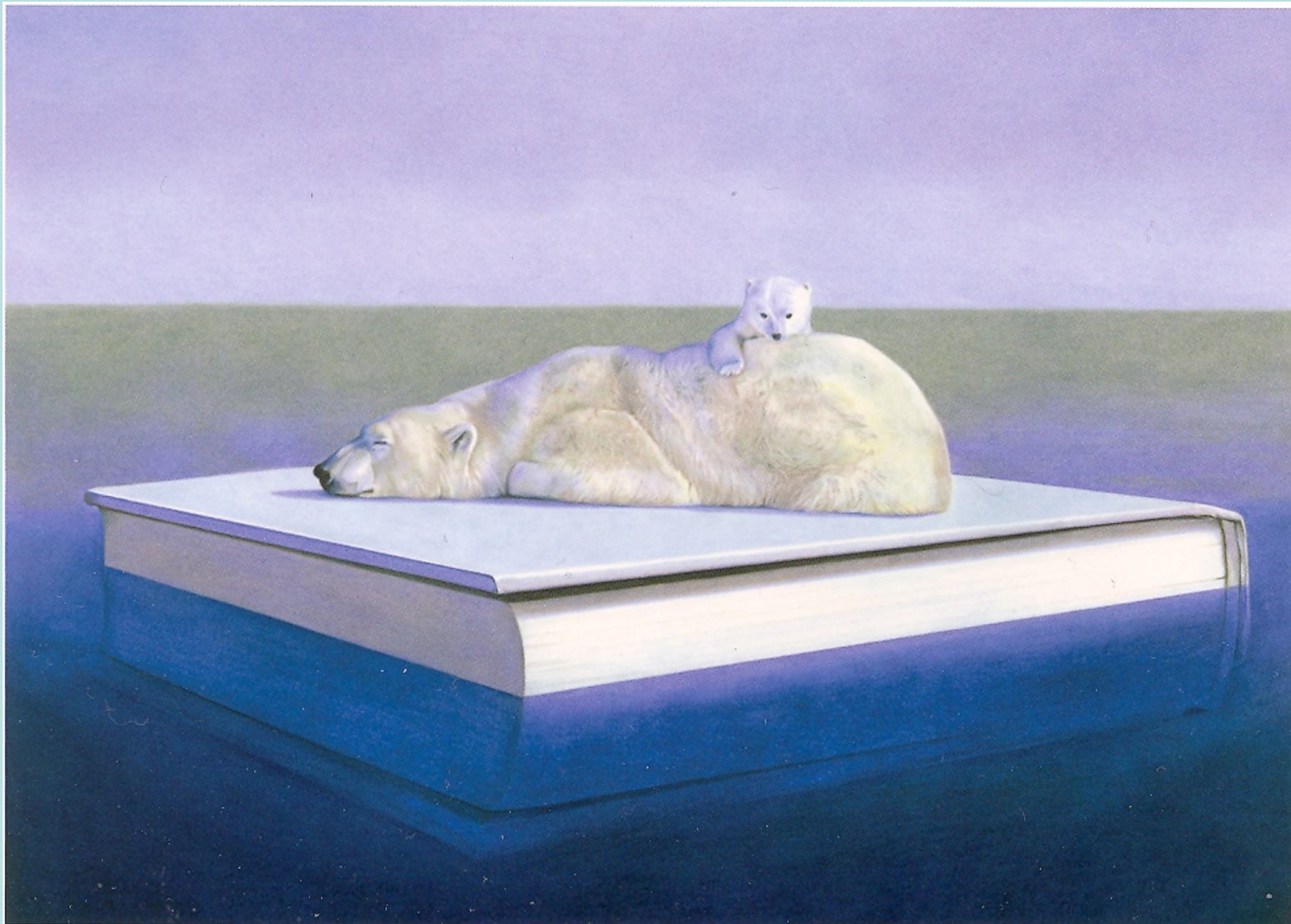


WIT AND ELSMAN  
©2002 Newsday

...THERE GOES  
THE NEIGHBORHOOD...







"PASSAGE 2" DON SIMON 2006

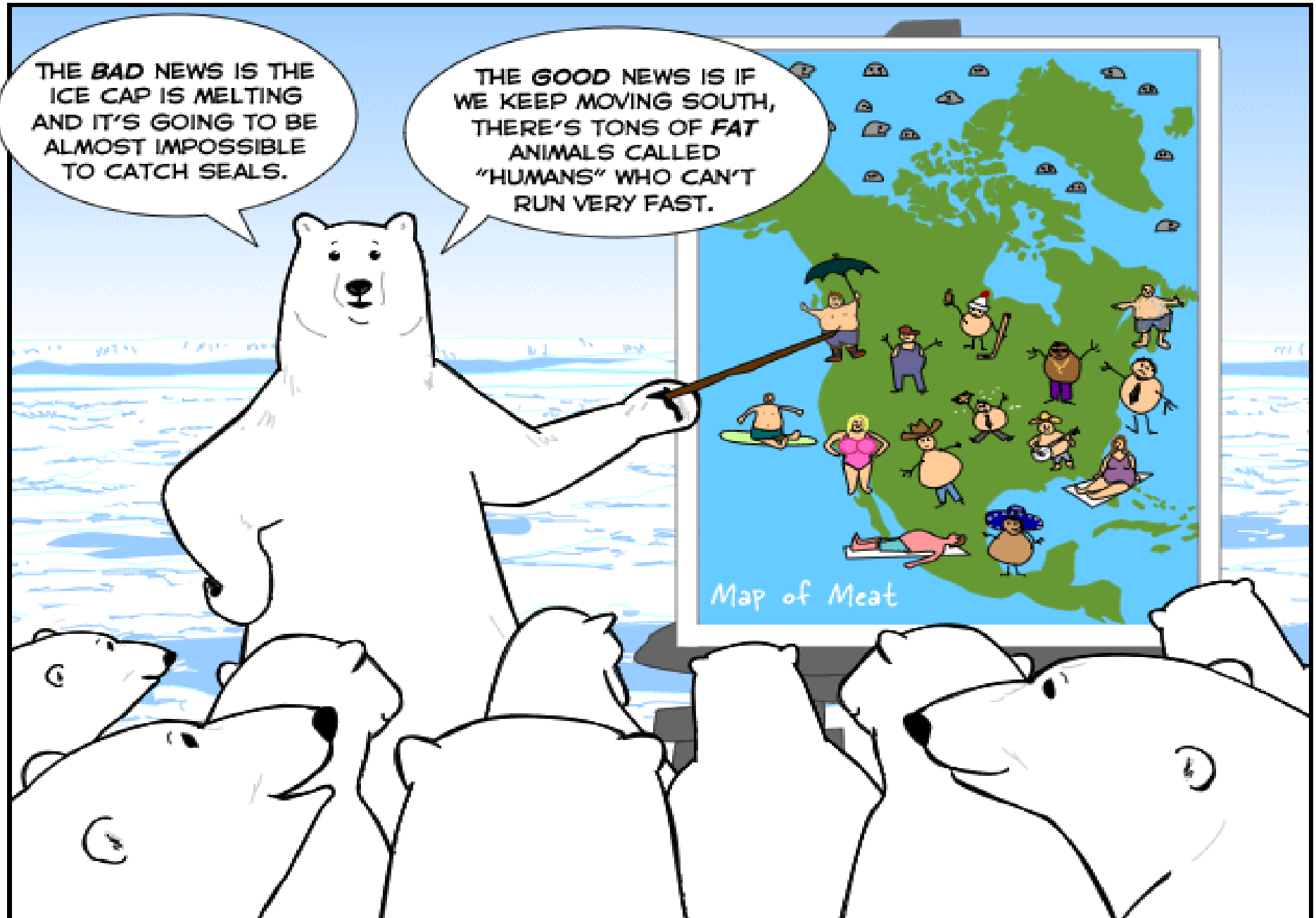
# The "Real" Cause of Global Warming



# The "Real" Cause of Global Warming



Victims As  
Villains





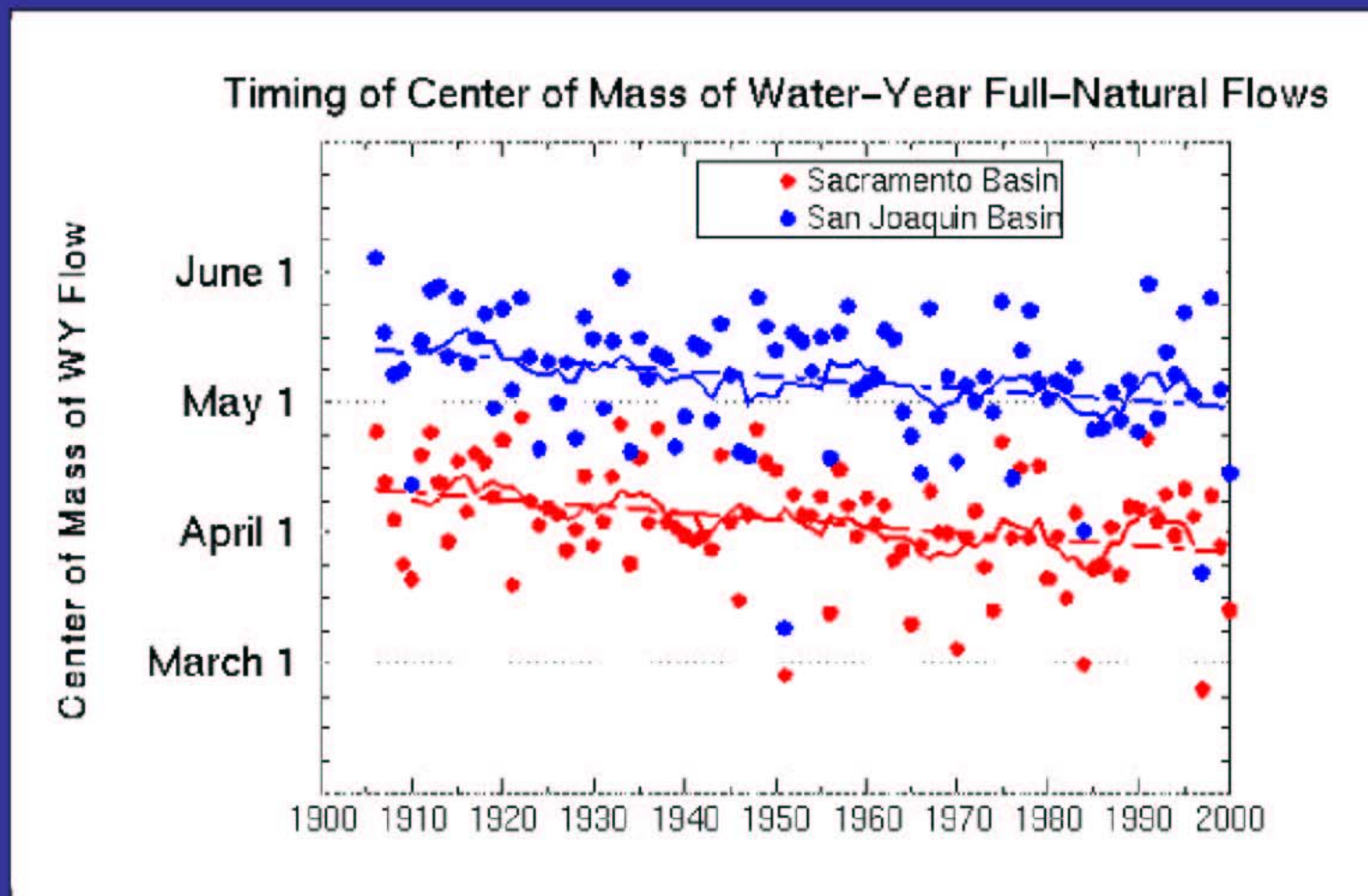


**Governor of  
California:  
80% reduction in  
emissions by 2050**

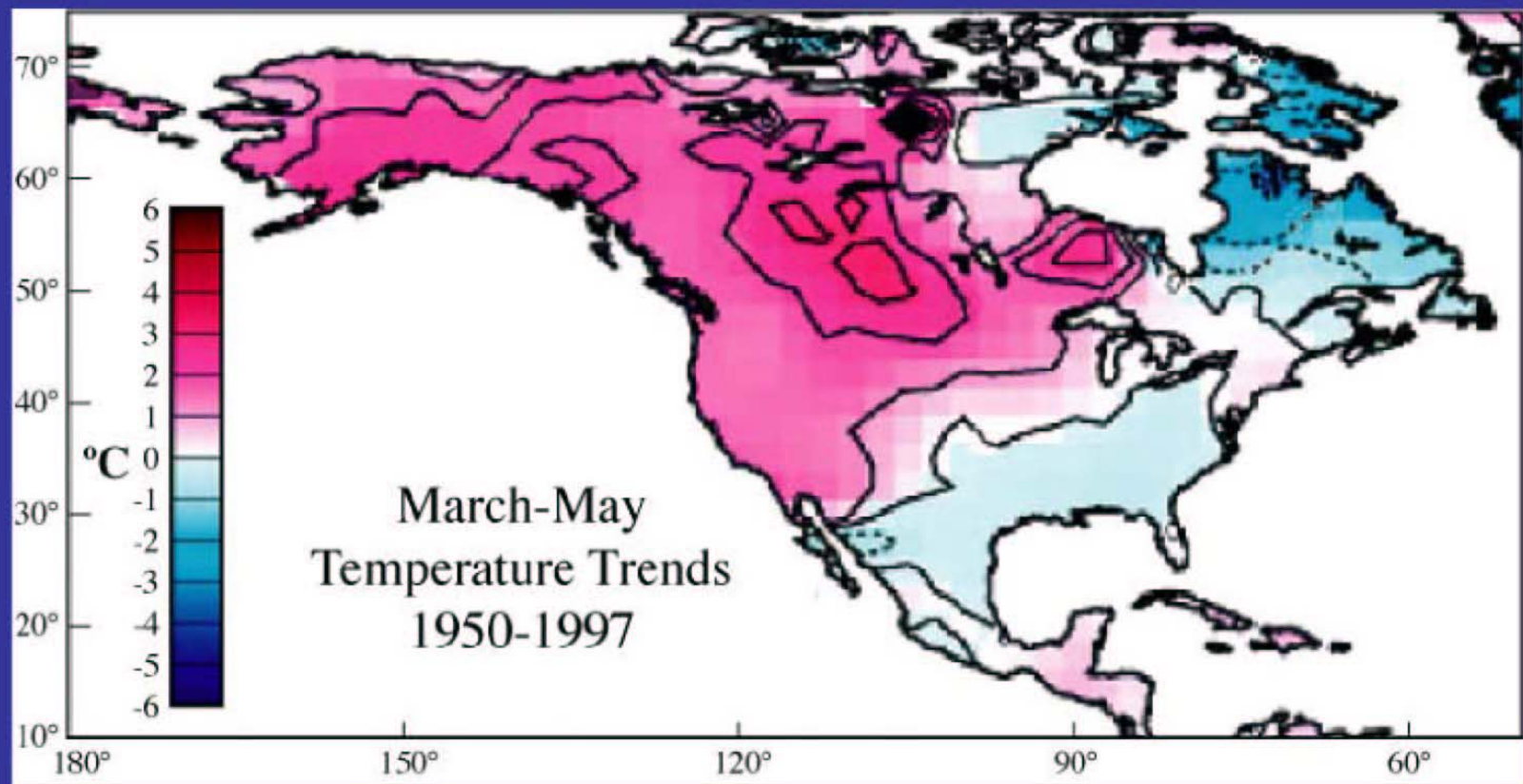
# Motivating Issues For A Sustainability Agenda For California on Climate Change



**In California**, this trend is widespread in the Sierra Nevada, and has yielded flows that are about 2 weeks earlier now.



**Not surprisingly, these timing and snowpack changes are attributable to long-term winter-spring warming trends across the West.**



Cayan et al., 2001





## “Very High Confidence” Global Warming Impacts

- North American Impacts Projected (cont'd)
  - **Fire & Pest Impacts:** “Disturbances from pests, diseases, and fire are projected to have increasing impacts on forests, with an extended period of high fire risk and large increases in area burned. “

*IPCC, Summary for Policymakers, Working Group II  
Contribution to the Fourth Assessment Report, April, 2007*

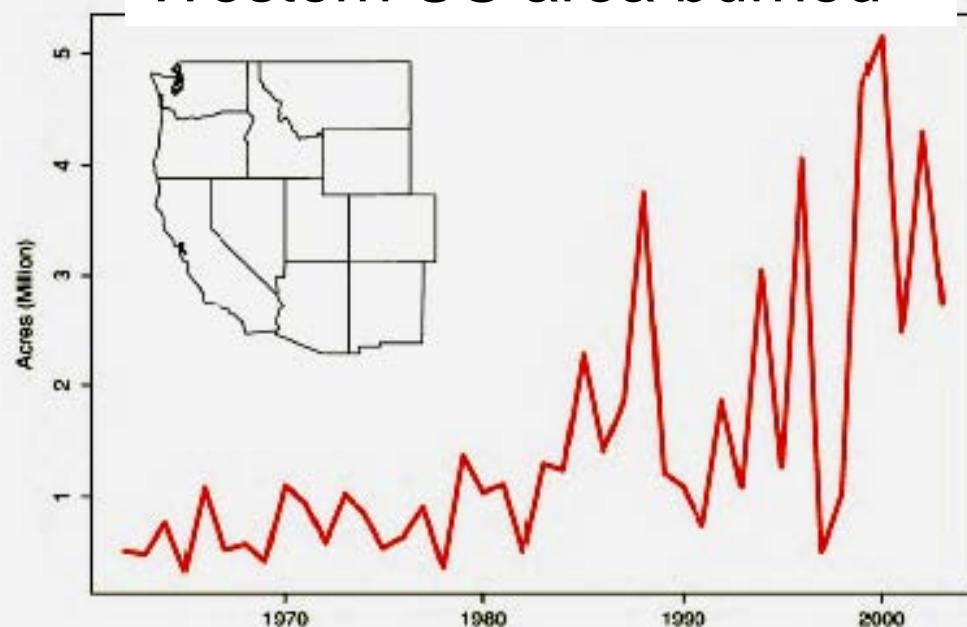




Risk of catastrophic fires  
(and other disturbances)

# Wildfires Frequency increased four fold in last 30 years.

Western US area burned



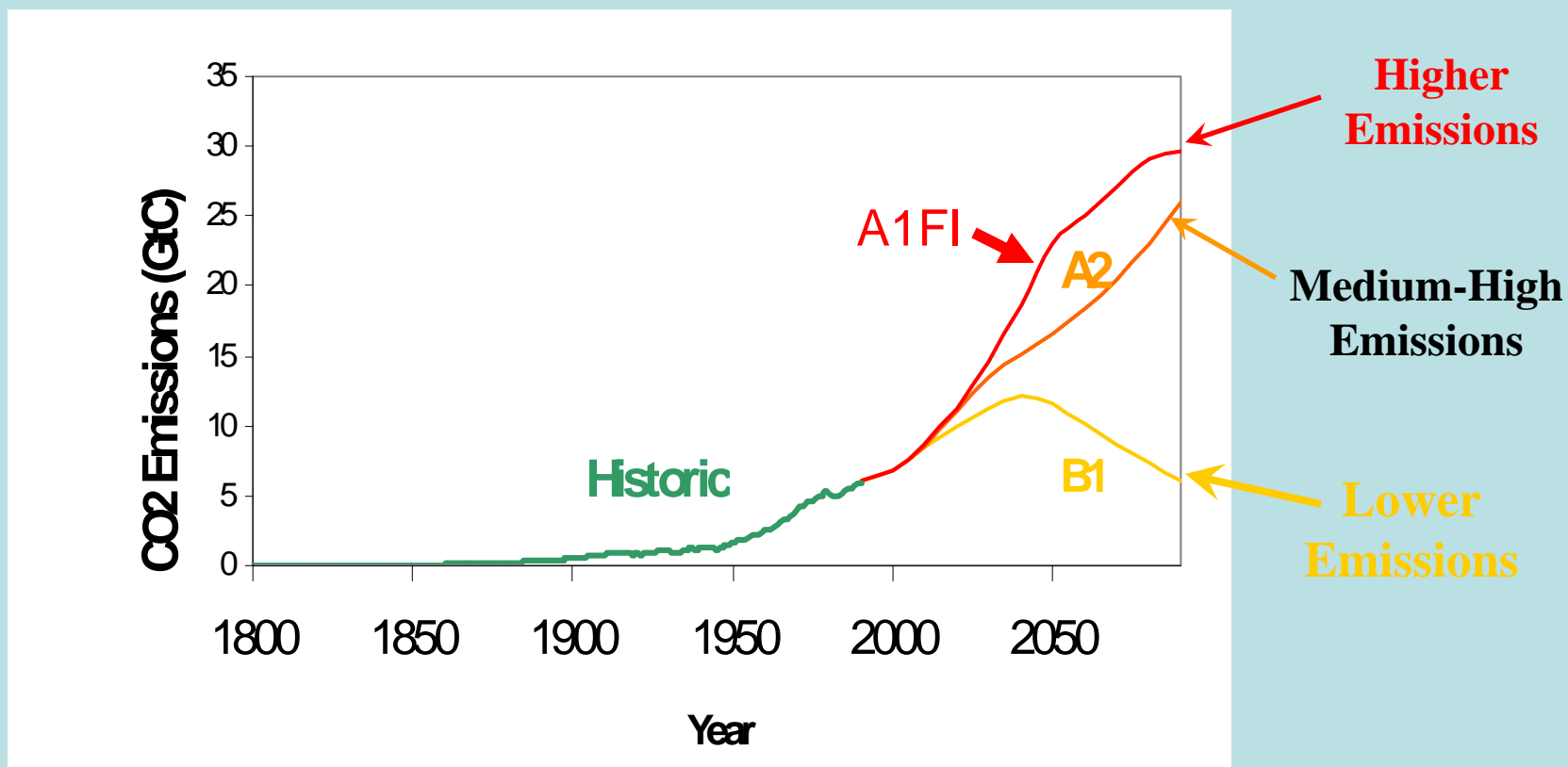
Source: Westerling et al. 2006





# We can Choose our Emissions Future

(Intergovernmental Panel on Climate Change Emission Scenarios)

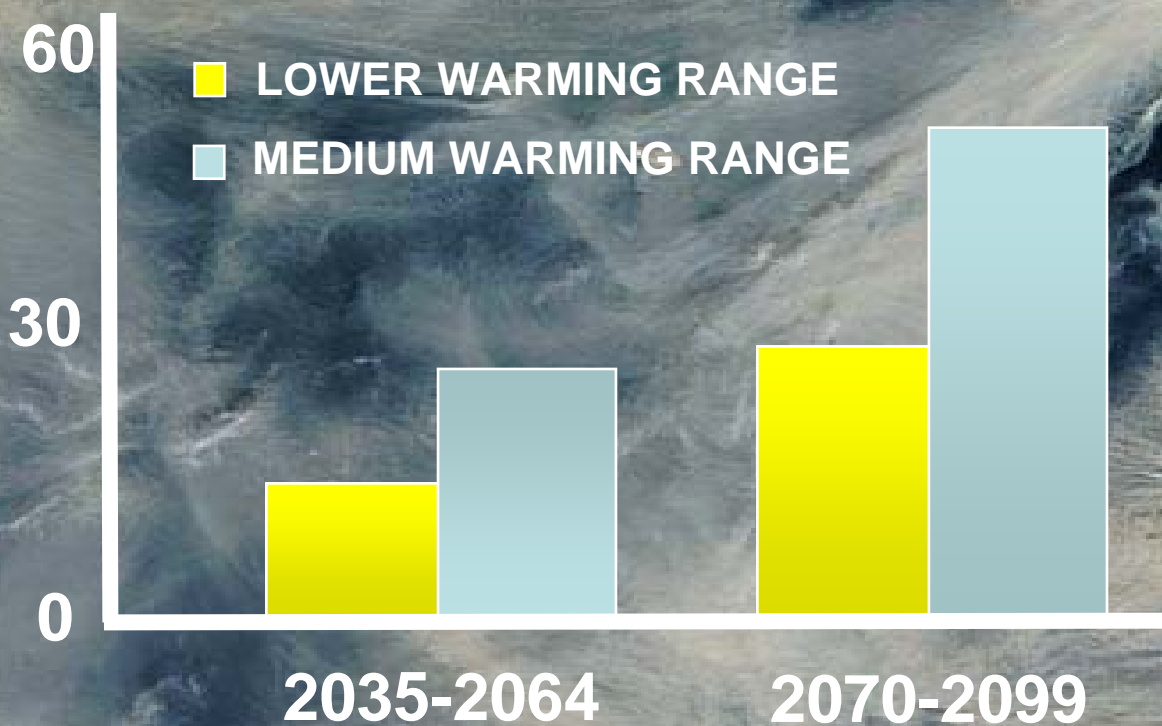


Just fossil fuel emissions shown in graphic.

# Increase in Wildfires

Pollution in Plumes

% CHANGE IN EXPECTED MINIMUM  
NUMBER OF LARGE FIRES PER YEAR



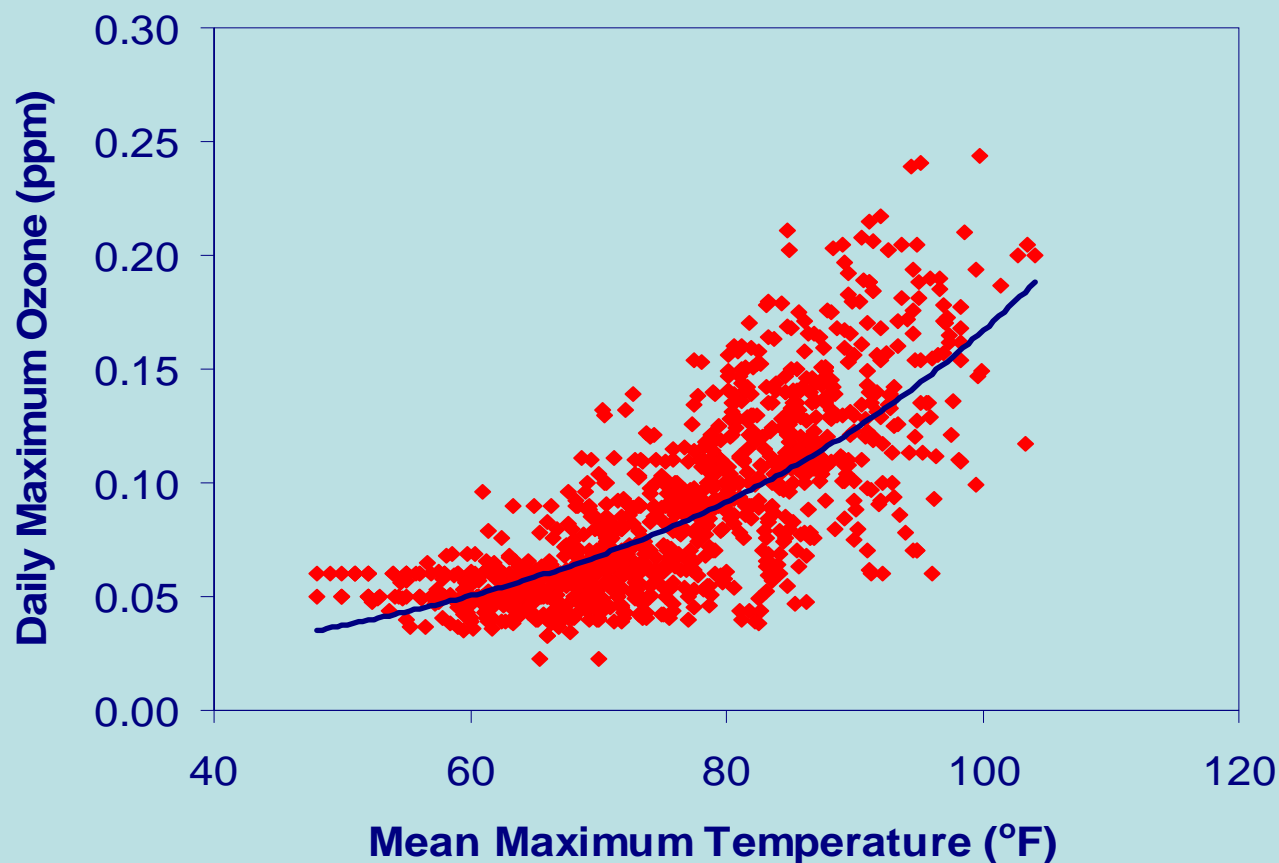
Source of data : Westerling and Bryant, "Climate change and wildfire in and around California: Fire modeling and loss modeling" (2006),

[www.climatechange.ca.gov](http://www.climatechange.ca.gov)



# Extraordinary & Compelling Conditions

## Hotter Days Lead to More Smog



**South Coast Air  
Basin**

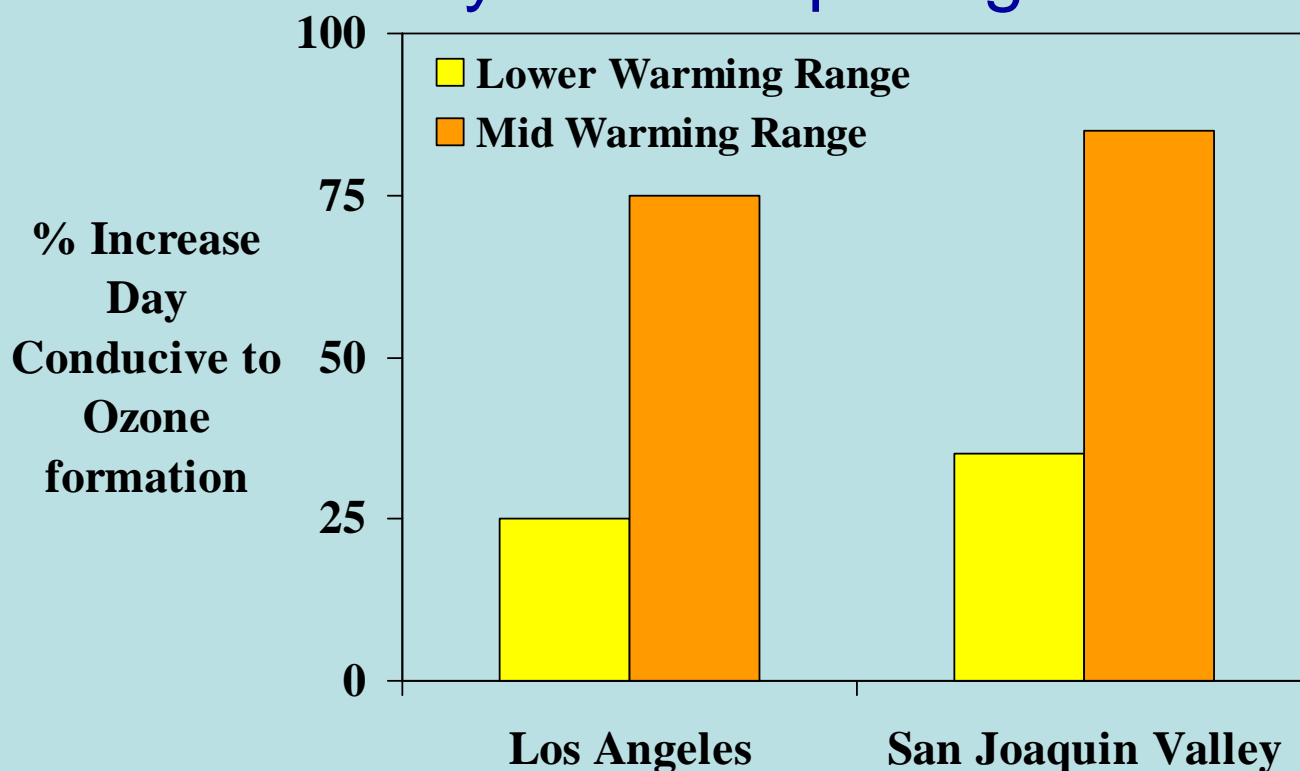
**Ozone Levels  
(1996-1999)**

Our Changing Climate: Assessing the Risks to California (2006),

[www.climatechange.ca.gov](http://www.climatechange.ca.gov). Source: Air Resources Board, 2000

# Extraordinary & Compelling Conditions

More Smog Likely: Section 209(b) clearly covers this extraordinary and compelling condition

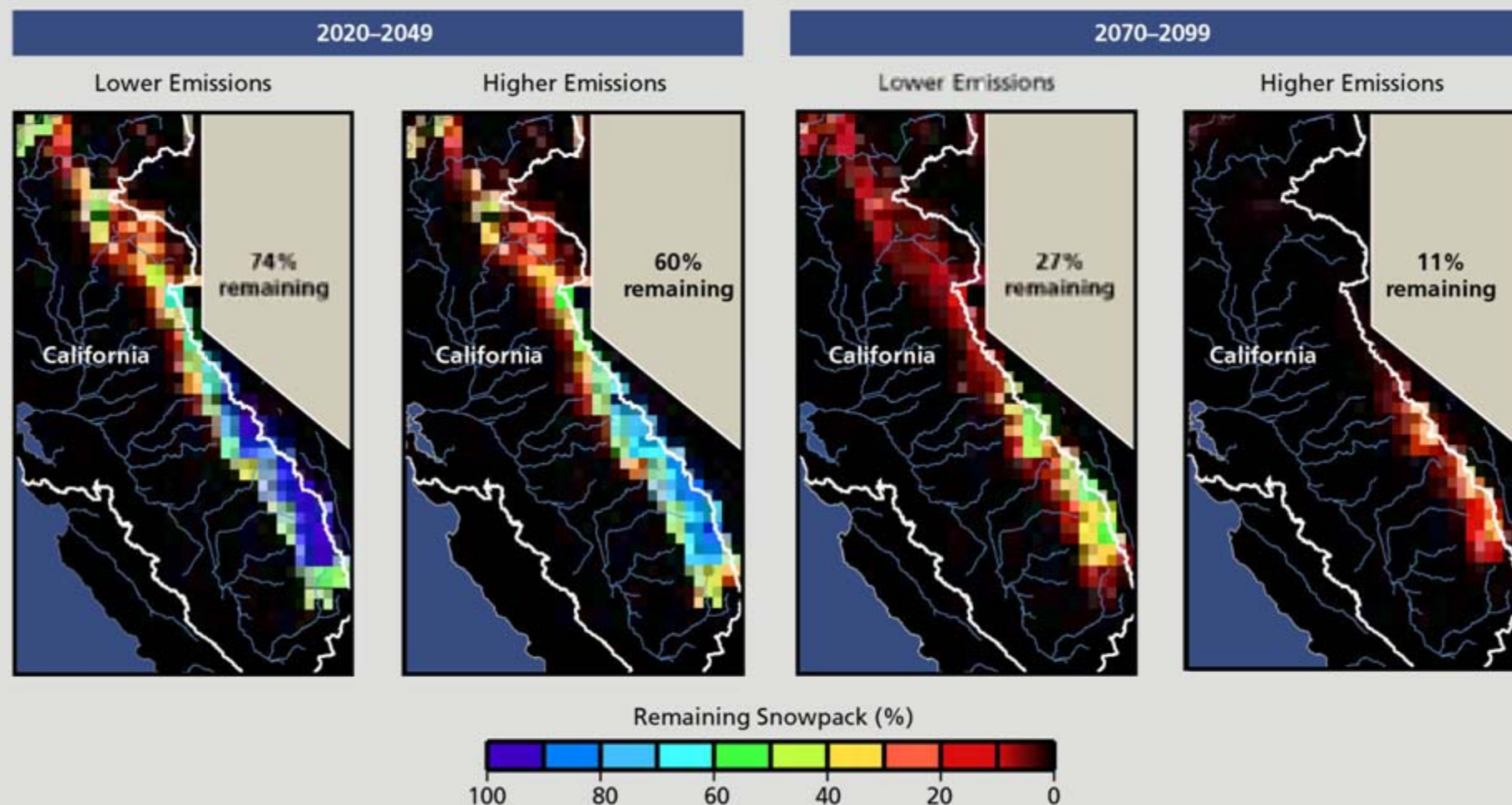


Our Changing Climate: Assessing the Risks to California (2006),  
[www.climatechange.ca.gov](http://www.climatechange.ca.gov)

Data from GFDL B1 and A2 runs. SOURCE: Kleeman et al. 2006

# Diminishing Sierra Snowpack

% Remaining, Relative to 1961-1990



# Decreasing Wine Grape Quality

## Temperature Impacts

	1961-1990	2070-2099			
	Current Conditions	Lower Emissions (B1)		Higher Emissions (A1fi)	
		PCM	HadCM3	PCM	HadCM3
Wine Country	Optimal (mid)	Impaired	Marginal	Impaired	Impaired
Cool Coastal	Optimal (low)	Optimal (mid-high)	Optimal (mid-high)	Optimal (high)	Impaired
Northern Central Valley	Marginal	Impaired	Impaired	Impaired	Impaired

Wine Country (Sonoma, Napa Counties)

Cool Coastal (Mendocino, Monterey Counties)

Northern Central Valley (San Joaquin, Sacramento Counties)

# WHAT ARE THE FUTURE IMPLICATIONS OF POPULATION, AFFLUENCE AND TECHNOLOGY GROWTH PROJECTIONS?

\*\*\*\*\*HOW

# CAN THE FUTURE BE SCIENTIFICALLY ANALYSED?

# NOSTRADAMUS PREDICTS HOTTEST SUMMER IN HISTORY

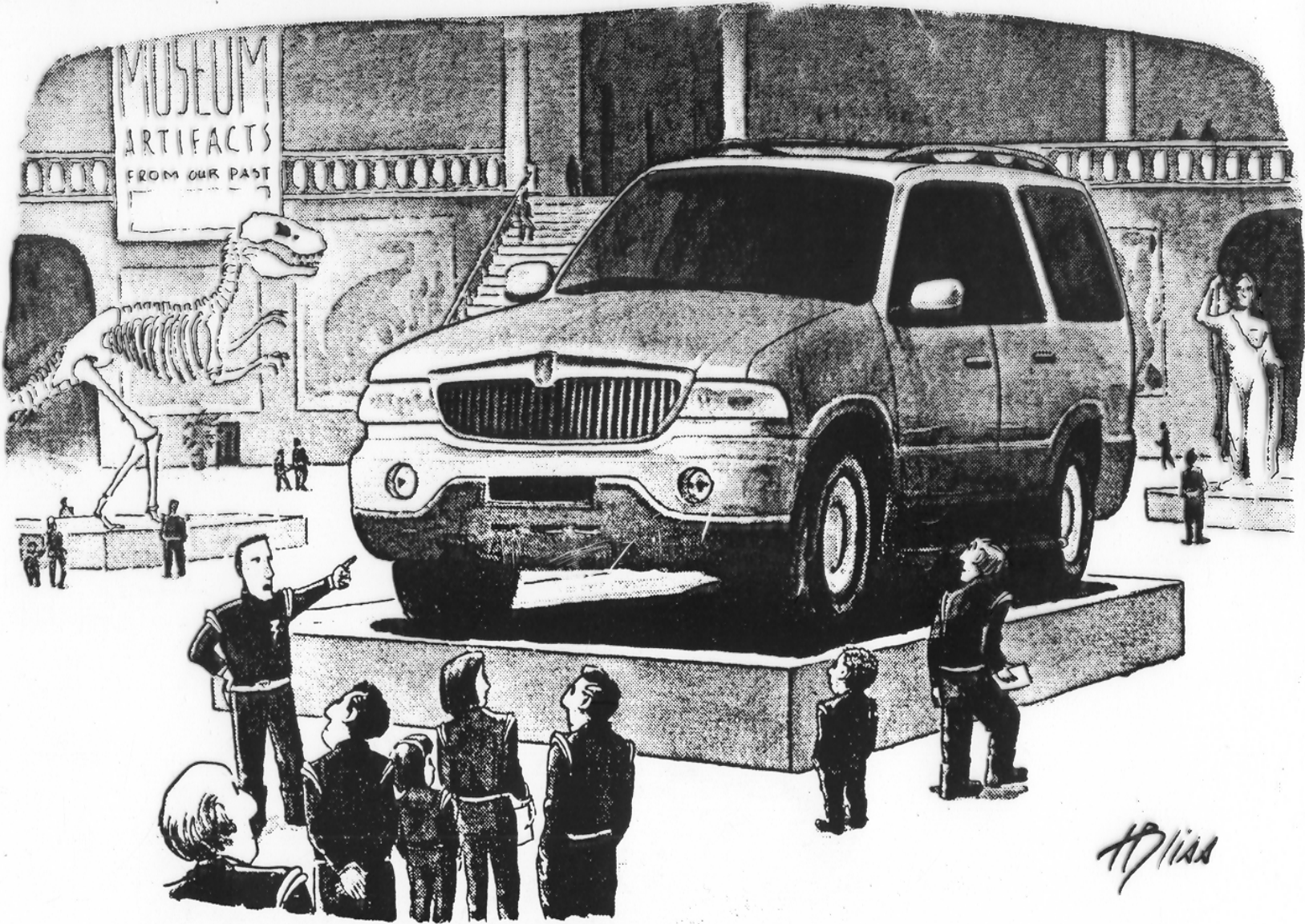


FAMOUS seer Nostradamus wrote a clear and specific poem that reveals the horrors of our upcoming weather.









*"We're not certain why they disappeared, but archeologists speculate that it may have had something to do with their size."*



# Large Vehicles Are the Solution, Not the Problem

By SAM KAZMAN

If you listen to journalists, you'd think sport-utility vehicles were more dangerous than Saddam Hussein. SUVs supposedly deplete the Earth's resources, poison its atmosphere and encourage rude driving. Worst of all, because of their size they allegedly pose a grave collision threat to just about anyone who ventures outdoors. According to a recent New York Times report, the worst safety hazard is yet to come—once these "expensive toys" depreciate and are sold by the "responsible family people" who now drive them, they'll be bought by teenagers who'll handle them even more recklessly.

These threats have been wildly overstated. And the solution proposed by many SUV critics, raising the federal fuel economy standards, would mean expanding a regulatory program that has already caused thousands of traffic deaths.

The federal Corporate Average Fuel Economy standards, enacted in the wake of the mid-1970s oil shocks, require each auto maker's annual output of new cars to meet a set fuel economy level. The current passenger-car CAFE standard is 27.5 miles per gallon; for light trucks, the standard is a more lenient 20.7 mpg.

The easiest way for car makers to meet ever-rising CAFE standards has been through continued car downsizing. As the National Highway Traffic Safety Administration itself noted, "weight reduction is probably the most powerful technique for improving fuel economy. . . . Each 10 percent reduction in weight improves the fuel economy of a new vehicle design by approximately 8 percent." The result was a CAFE-driven downsizing of approximately 500 pounds per car.

Smaller cars, however, are less crash-worthy than similarly equipped large cars in practically every type of accident. According to a 1989 Harvard-Brookings study, CAFE-induced downsizing has increased car occupant fatalities by between

14% and 27%; that translates to between 2,000 and 4,000 extra deaths a year.

You'd think that NHTSA, an agency whose middle name is safety, would have brought this issue to the forefront of public attention. But instead NHTSA has repeatedly claimed that CAFE has no safety effect. In a 1992 court case brought by the Competitive Enterprise Institute and Consumer Alert, a panel of federal appeals judges blasted NHTSA's position as "fudged analysis," "statistical legerdemain" and "bureaucratic mumbo-jumbo."

If CAFE had been a privately produced product, it would long ago have been recalled as defective and its producer, NHTSA, jailed for the coverup. But because CAFE is a product of Washington rather than Detroit, it remains in place; worse yet, it threatens to expand in the face of the SUV "threat."

The overblown nature of that threat is demonstrated by a study issued last month by the Insurance Institute for Highway Safety. Journalists widely reported the study as re-emphasizing the need for action against SUVs, but its findings indicate otherwise. What the institute found was that collisions between cars and SUVs account for only 4% of car occupant fatalities.

Cars are most vulnerable in side impact collisions. According to the institute, in fatal collisions involving cars that are hit on the side by SUVs, the relative risk that the death will be in the car rather than the SUV is an apparently lopsided 27-to-1. But when this relative risk is broken down by car weight categories, it turns out that car-SUV mismatches are frequently outweighed by other common collision disparities. For example, the occupants of a light car struck in the side by a heavy car

face a greater relative risk of death than when a heavy car is side-impacted by an SUV. That is, there is a greater mismatch between light cars and heavy cars than there is between heavy cars and SUVs.

What this means is that upsizing the car fleet may well be the most important step we could take toward improving safety. But upsizing, of course, is what CAFE currently restricts.



You're safer in a sport utility vehicle.

The same conclusion emerges from a 1997 NHTSA study, which was similarly characterized as indicting SUVs but which turns out, on closer analysis, to indict CAFE. A NHTSA press release touted the study's finding that a 100-pound decrease in SUV weight would

prevent 40 fatalities per year, most of them in cars colliding with SUVs. But according to the study itself, this conclusion was not statistically significant; there might even be a net loss of life from such downsizing, and on balance the overall effect would be "negligible." More important, those minimal effects paled in comparison to the effects of a 100-pound increase in passenger car weight—a saving of over 300 lives a year. And the effect of this passenger car upsizing was found to be statistically significant, unlike the SUV downsizing.

Upsizing, however, would entail relaxing CAFE rather than tightening it—a move that would be totally alien to this administration and to its environmentalist supporters. The Sierra Club, for example, claims that higher CAFE standards would be "the biggest single step to curbing global warming." In their 1992 campaign book, Bill Clinton and Al Gore recommended raising CAFE to 40 mpg by 2000—a level whose potential safety consequences add more than a little irony to the book's title, "Putting People First."

SUV critics argue, to use Consumer Reports' words, that "most people who buy an SUV don't need one." But what one person doesn't need is largely a matter of another person's opinion. In the early 1800s the Duke of Wellington complained that the new railroads would "only encourage the common people to move about needlessly." Today the elitist view is that the

he bought it for safety, to distinguish himself from "some teenager" trying "to be cool." Too bad his regulatory approach doesn't do much for other people's safety.

In fact, much of the SUVs' recent popularity stems from CAFE itself. CAFE's restrictions took their greatest toll on large cars and station wagons. As economist Paul Godek pointed out in a study published last fall, light trucks were the only real alternative for consumers concerned about safety and seating capacity. In effect, he concludes, most of the weight forced off the passenger car fleet by CAFE has reappeared in the light truck fleet.

So the real problem is CAFE, not SUVs. The next time you hear the term SUV, remember: The "S" might as well stand for scapegoat.

Mr. Kazman is general counsel of the Competitive Enterprise Institute in Washington.

March 13, 1999

## THE WALL STREET JOURNAL

Peter R. Kann Chairman & Publisher	Kenneth L. Burenga President
Paul E. Steigler Managing Editor	Robert L. Bartle Editor
Byron E. Calame Daniel Hertzberg Deputy Managing Editors	Daniel Hamming Deputy Editor Editorial Page
Vice Presidents	
Danforth W. Austin Paul C. Atkinson William E. Casey Jr. Michael F. Sheehan Charles F. Russell F. Thomas Kull Jr.	General Manager Advertising Circulation Production Technology Operations

Published since 1889 by  
**DOW JONES & COMPANY**

Peter R. Kann, Chairman & Chief Executive Officer.  
Kenneth L. Burenga, President & Chief Operating Officer, CEO, Dow Jones Markets.

Senior Vice Presidents: James H. Ottaway Jr., Chairman, Ottaway Newspapers; Peter G. Skinner, General Counsel.

Vice Presidents/Operating Groups: Karen Elliott House, President, International; Paul J. Ingram, President, NewsWire; Dorothea Coccoli Palaho, President, Interactive Publishing.

**‘The words of the prophet are  
written on the...?’**



MELTING  
DOES WELL AT THE POLES.



THE NEW H2.

**HUMMER** LIKE NOTHING ELSE

VIACOM

## Cars on a diet!









**PLUG-IN HYBRIDS**  
See PICTURES

**100+ MPG**

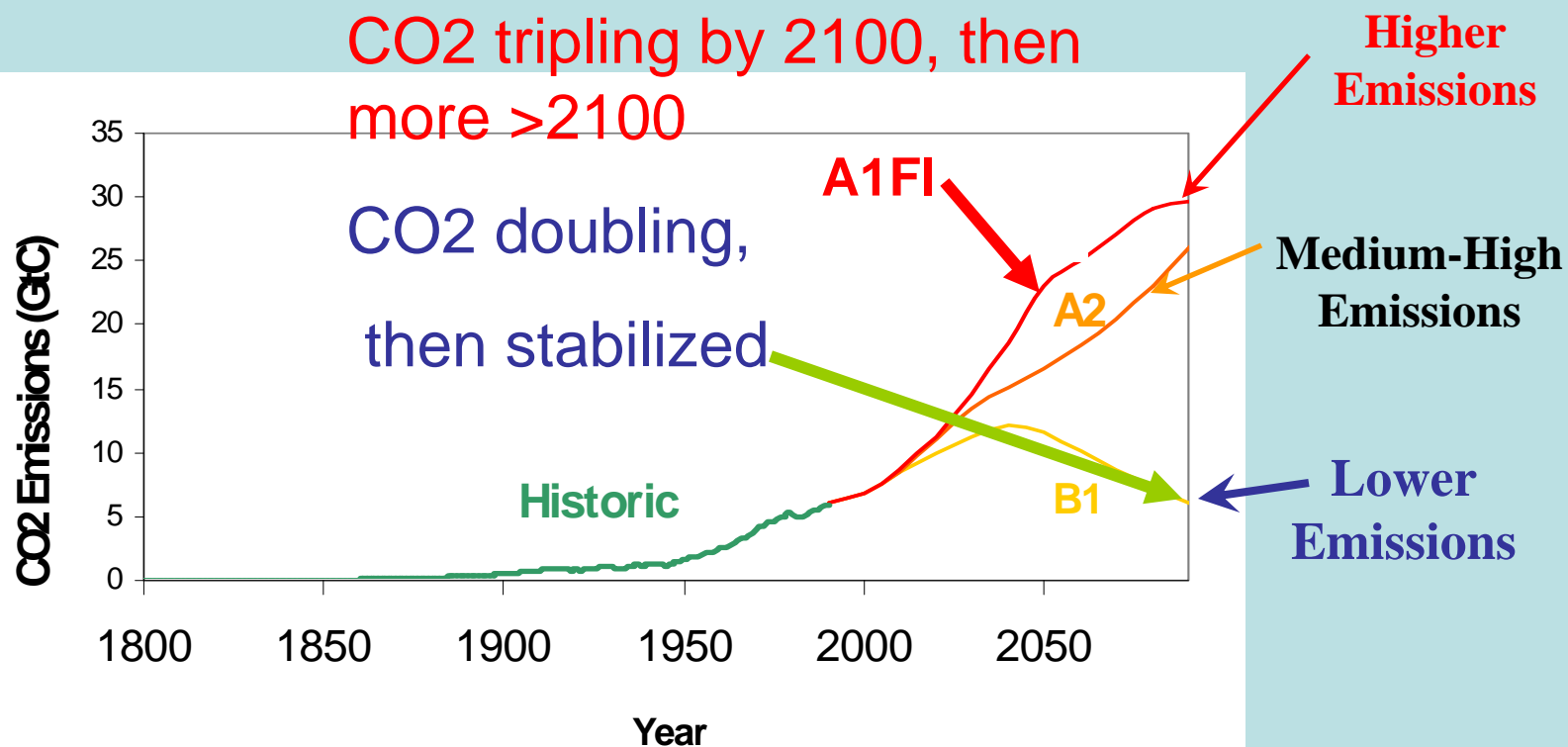
**Comparative CO<sub>2</sub> Emissions**

Vehicle Type	CO <sub>2</sub> Emissions (g/mile)
Gasoline	~180
Hybrid	~100
Plug-in Hybrid	~50

Source: GreenSource, gpa, 2008

# We can Choose our Emissions Future

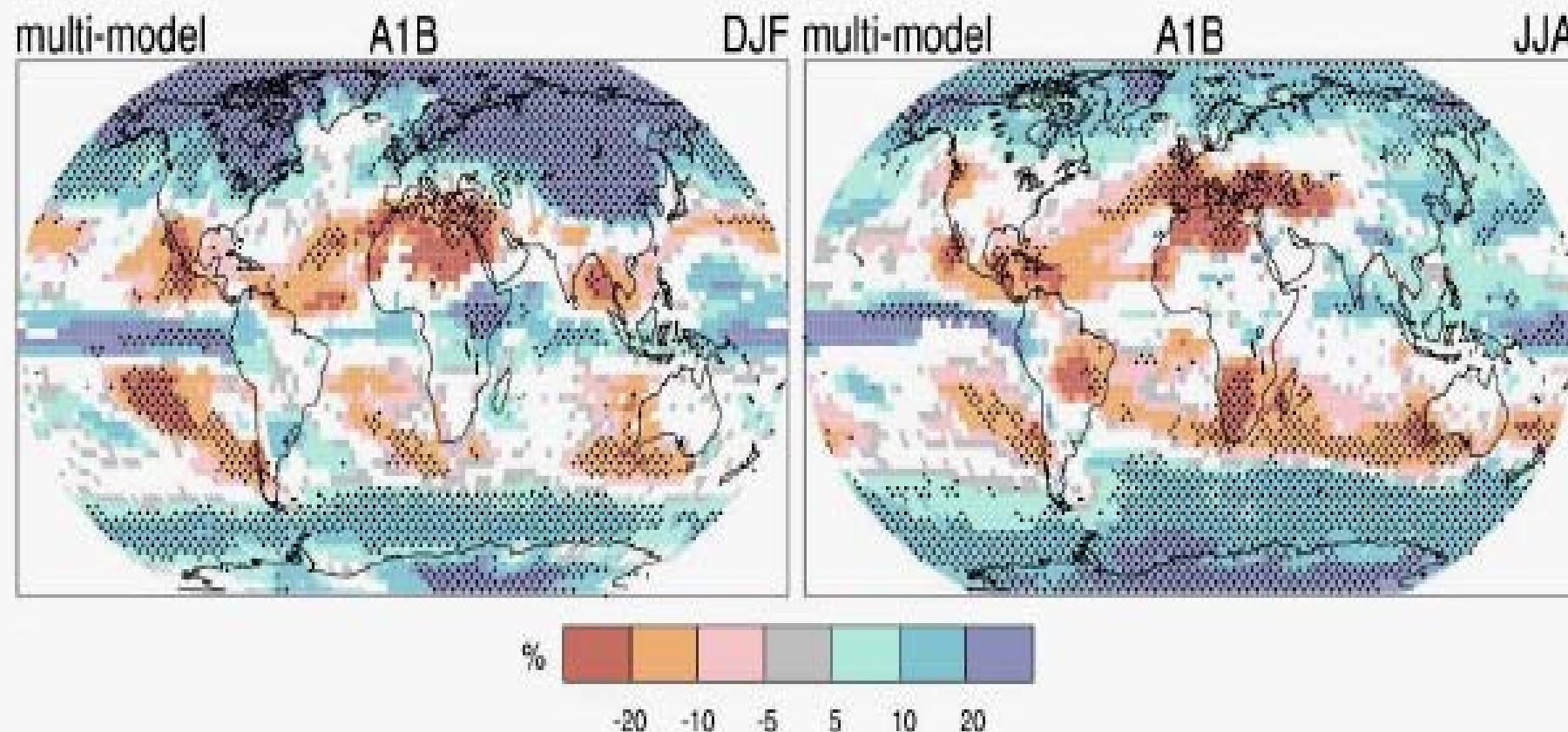
(Intergovernmental Panel on Climate Change Emission Scenarios)



Just fossil fuel emissions shown in graphic.



## Projected patterns of precipitation changes **Any Robust Conclusions?**

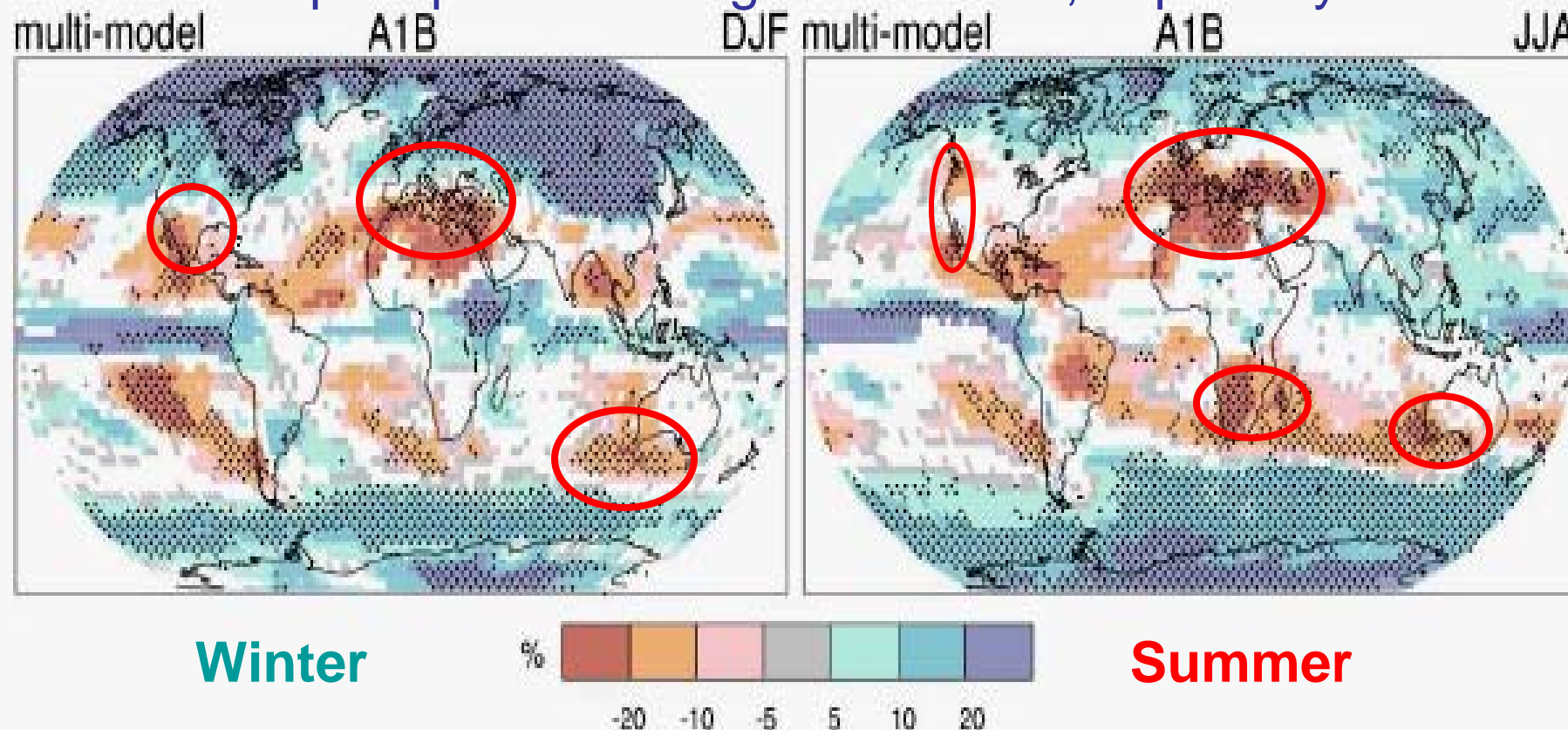


**Figure 3.3.** Relative changes in precipitation (in percent) for the period 2090–2099, relative to 1980–1999. Values are multi-model averages based on the SRES A1B scenario for December to February (left) and June to August (right). White areas are where less than 66% of the models agree in the sign of the change and stippled areas are where more than 90% of the models agree in the sign of the change. [WGI Figure 10.9]

**Yes (unfortunately) in many drier areas**

Projected patterns of precipitation changes

More precipitation in higher latitudes, especially in winter



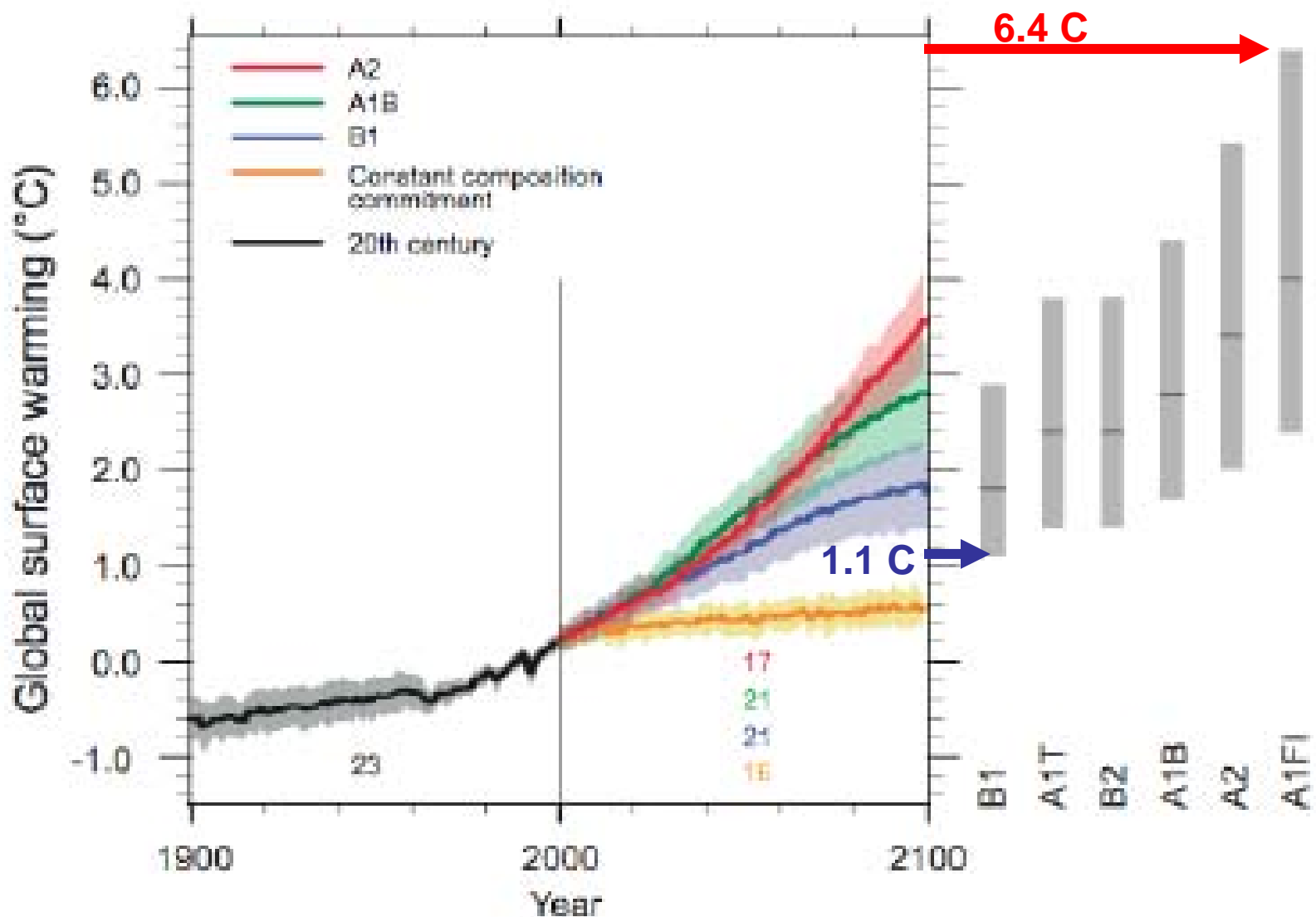
**Figure 3.3.** Relative changes in precipitation (in percent) for the period 2090–2099, relative to 1980–1999. Values are multi-model averages based on the SRES A1B scenario for December to February (left) and June to August (right). White areas are where less than 66% of the models agree in the sign of the change and stippled areas are where more than 90% of the models agree in the sign of the change. [WGI Figure 10.9]



Source: IPCC, WG 1, AR4, 2007

# Is The Science “Settled”?

# Warming Very Likely—But How Much?: Wide Range



Source: IPCC, WG 1, AR4, 2007

Risk = Probability\* x  
Consequence  
[What metrics\*\* of harm?]

- \$/ton C avoided
- lives lost/ton C avoided
- species lost/ton C avoided
- increased inequity/ton C avoided\*
- quality of life degraded/ton

\* Subjective probability density functions

\*\* Any weights on each metric are normative



# PARADIGMATIC DILEMMA (All language is from IPCC SPMs):

Risk management framework emerges as a useful framework to address key vulnerabilities.

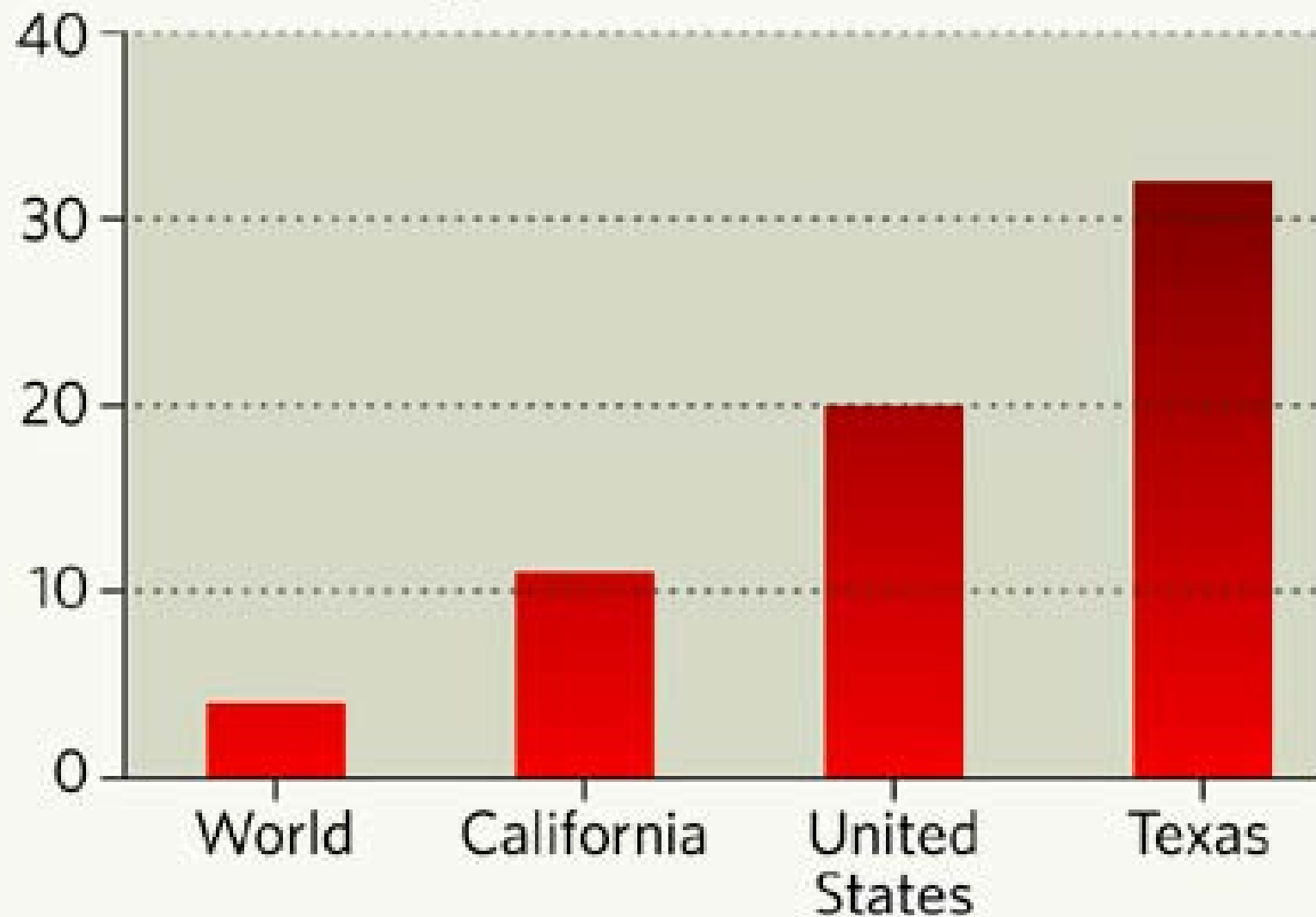
# PARADIGMATIC DILEMMA (All language is from IPCC SPMs):

Risk management framework emerges as a useful framework to address key vulnerabilities.

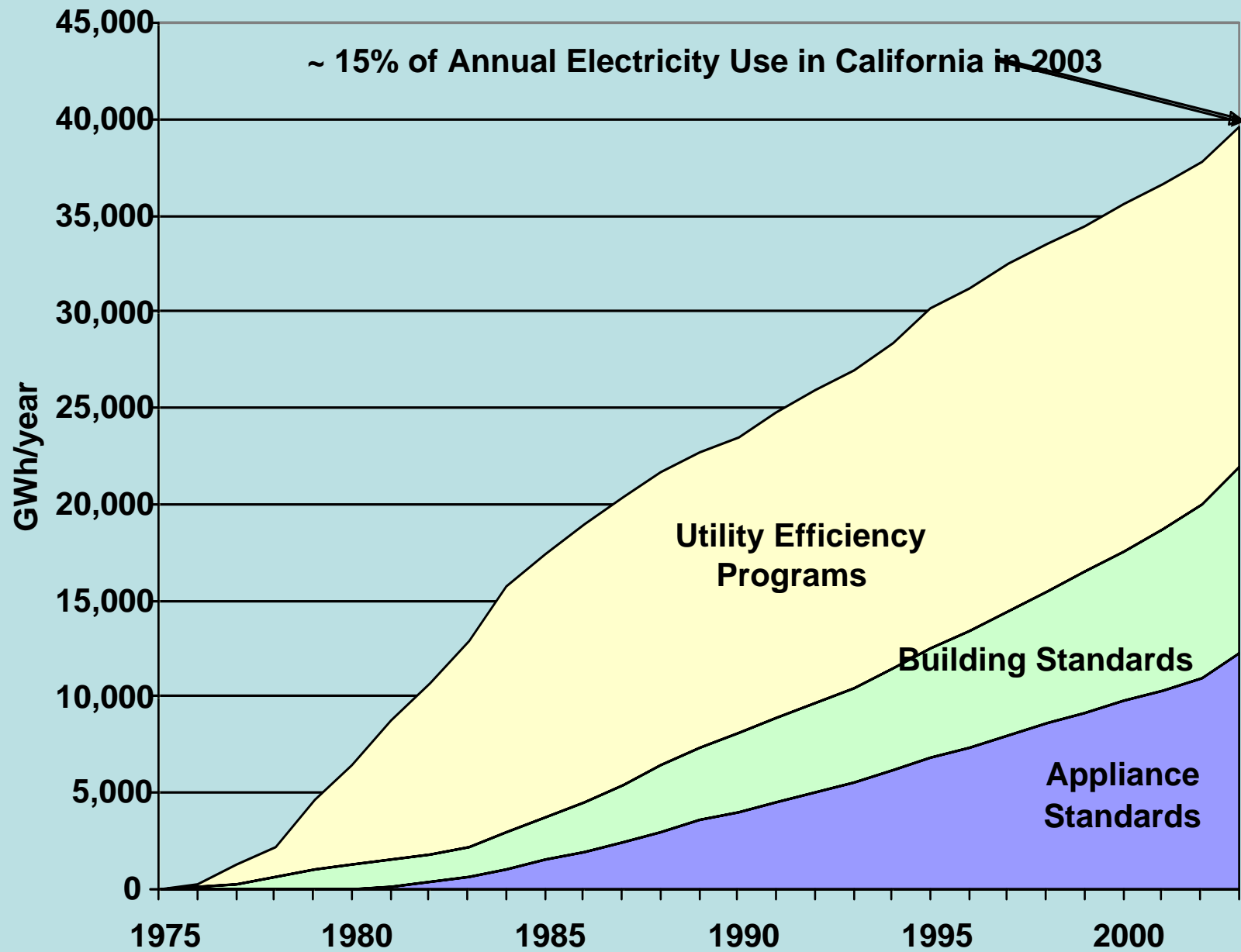
“versus”

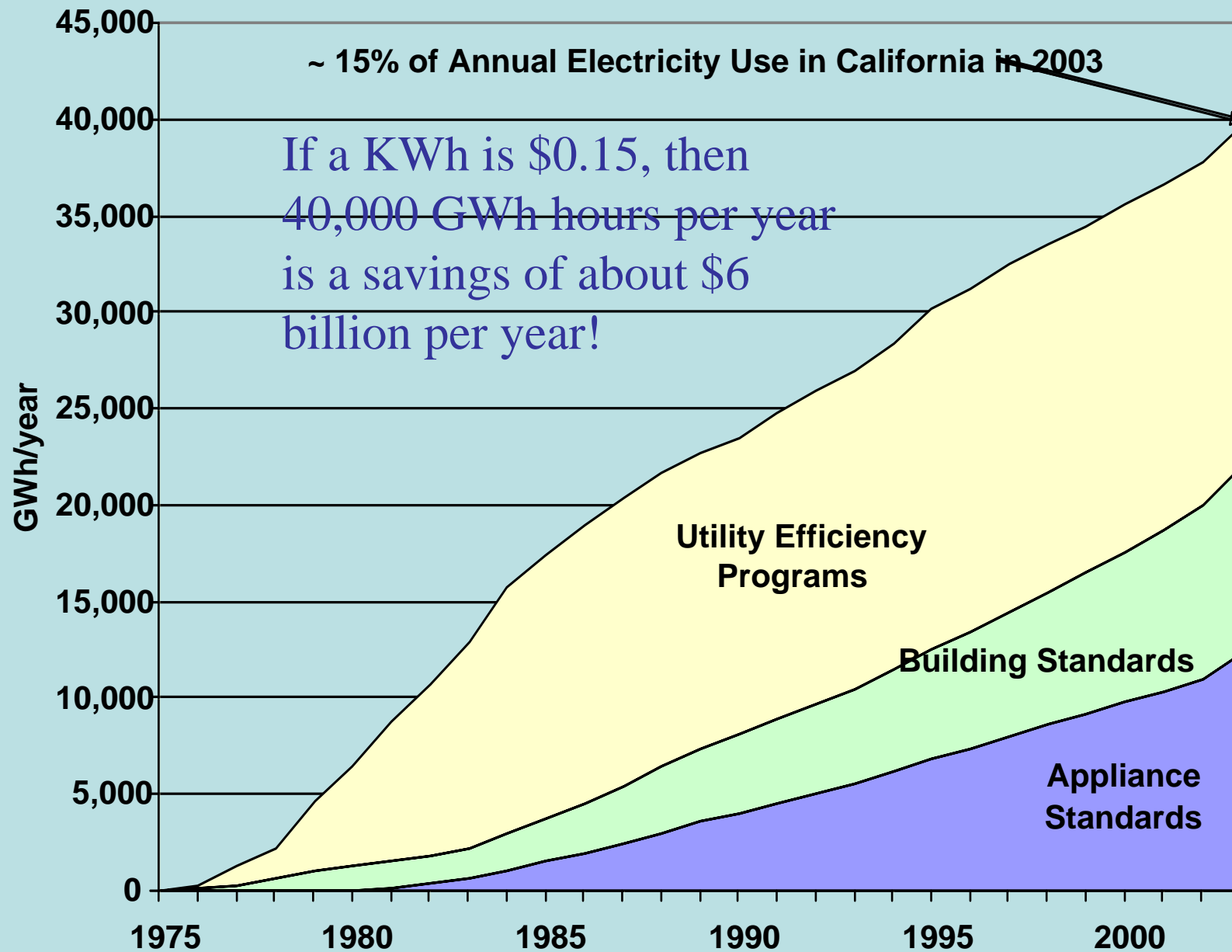
However, the assignment of probabilities to specific key impacts is often very difficult due to the large uncertainties involved.

## TONNES OF CO<sub>2</sub> EMISSIONS PER CAPITA, 2003



Source: World Resources Institute.

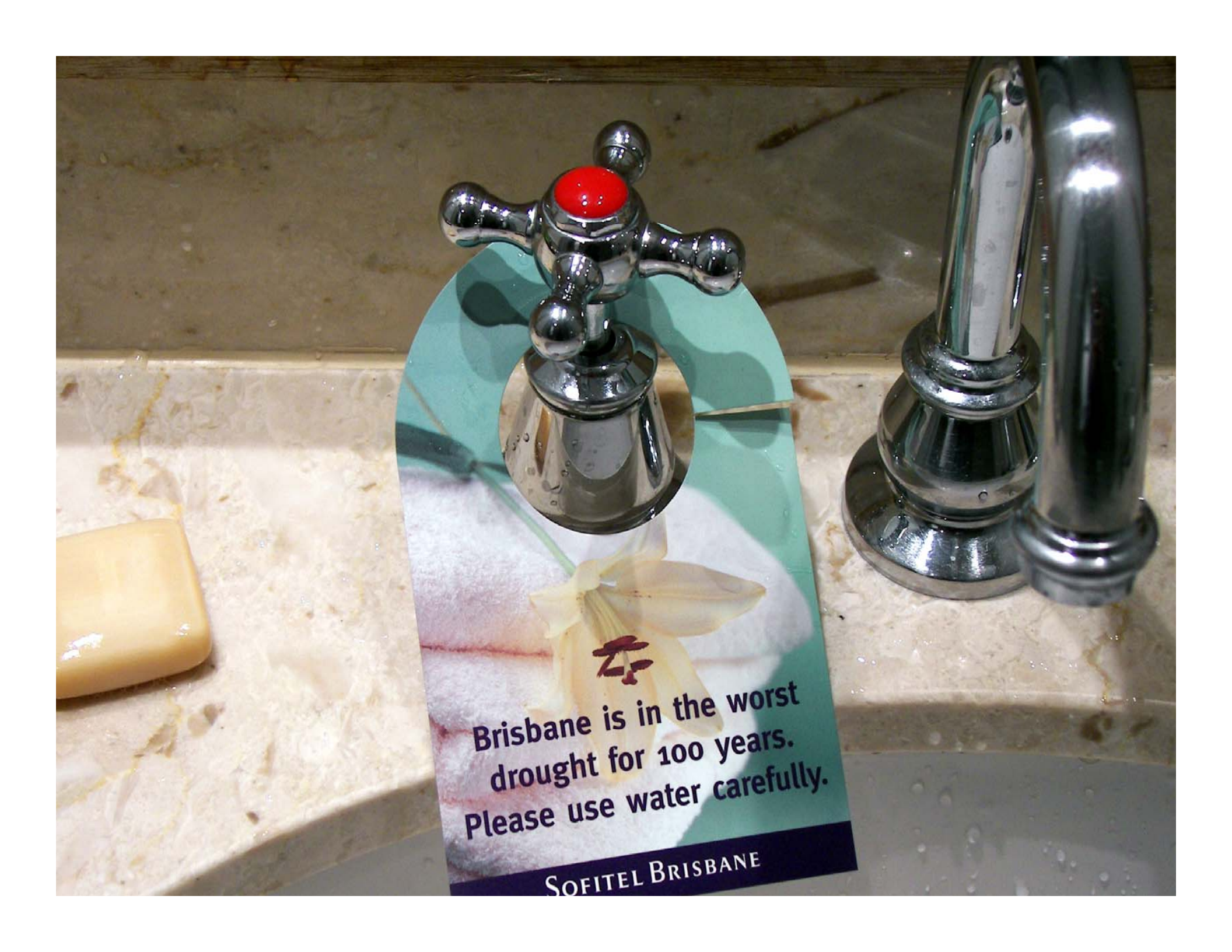






## Methods to achieve announced climate sustainability goals?

- **Volunteerism**



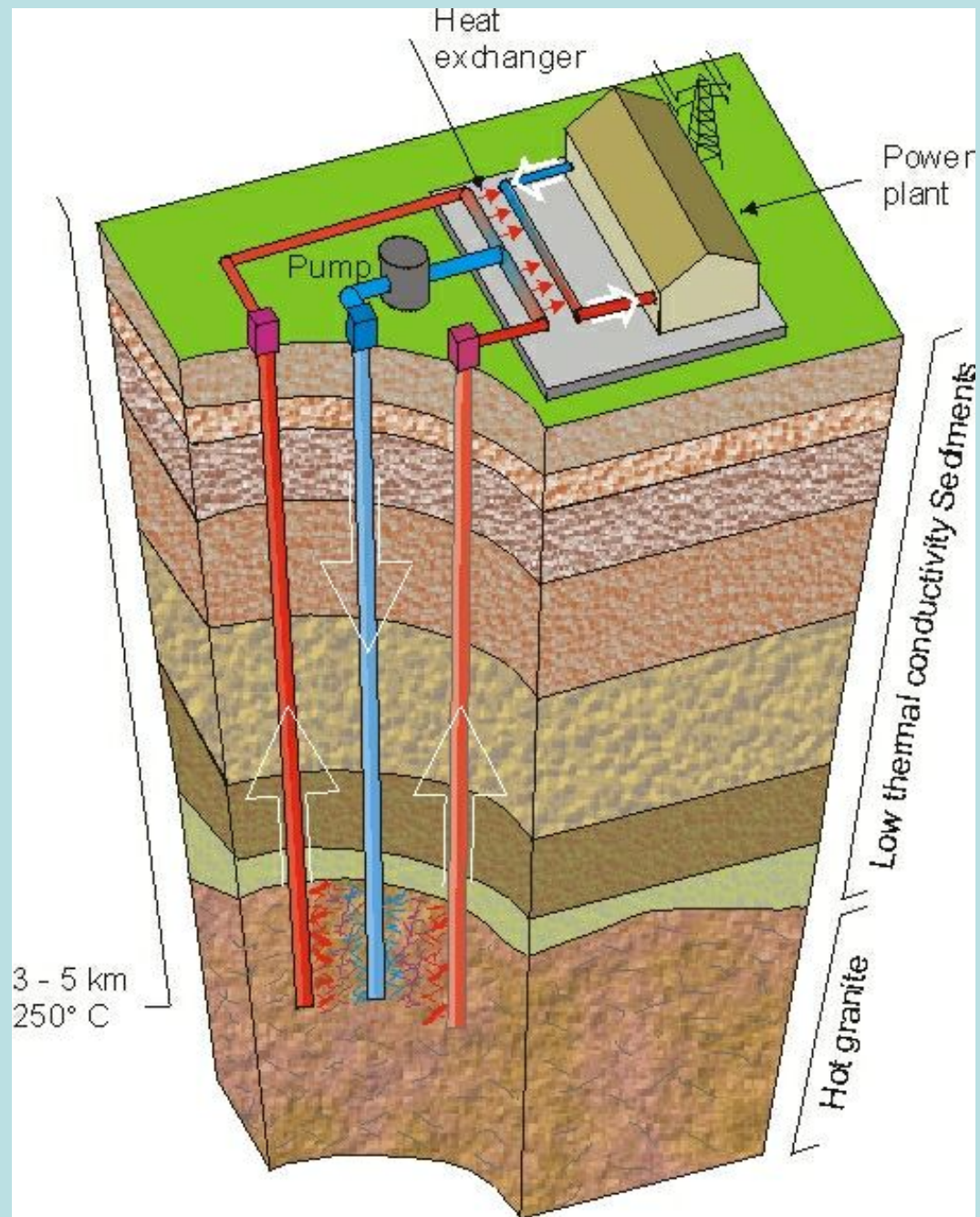
**Brisbane is in the worst  
drought for 100 years.  
Please use water carefully.**

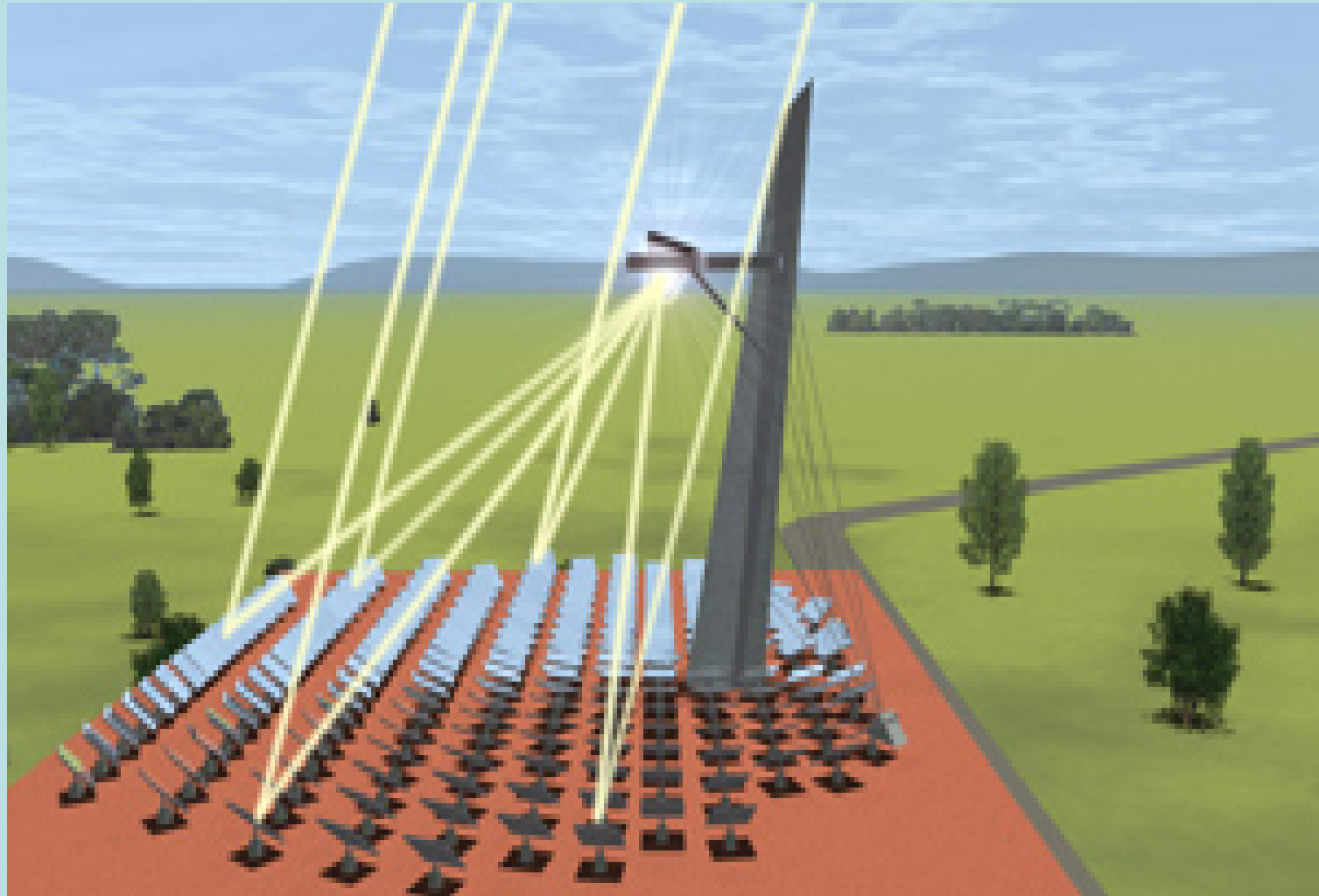
**SOFITEL BRISBANE**

## Methods to achieve announced climate sustainability goals?

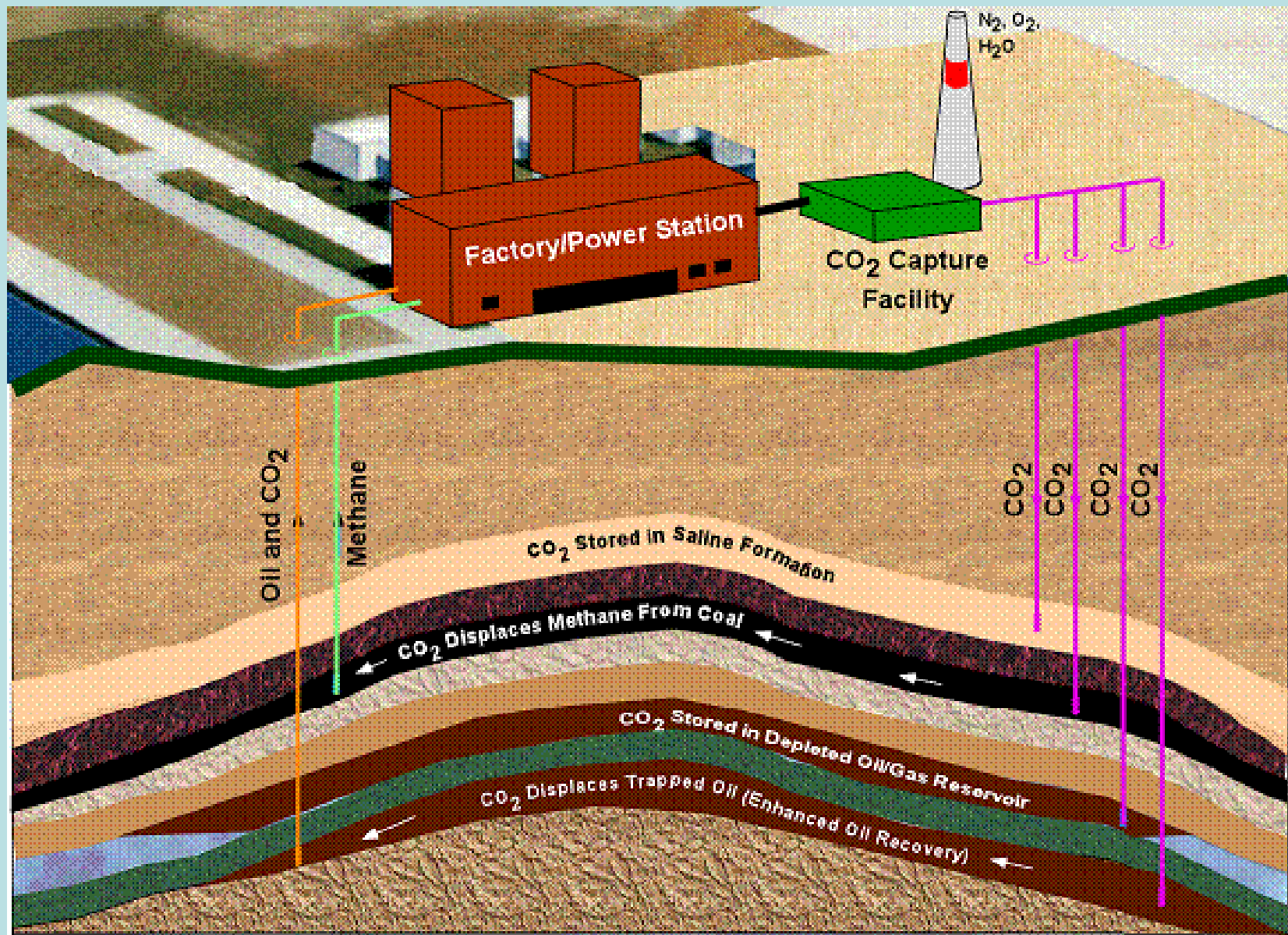
- Volunteerism
- **Technology, R,D & D subsidies**













## Some general principles:

- Start smart

## Some general principles:

- Start smart
- Do well by doing good

## Some general principles:

- Start smart
- Do well by doing good
- **Stress the win-wins**



## Some general principles:

- Start smart
- Do well by doing good
- Stress the win-wins
- **Just transitions for those negatively affected**

## Some general principles:

- Start smart
- Do well by doing good
- Stress the win-wins
- Just transitions for those negatively affected
- **Advanced notice**

## Some general principles:

- Start smart
- Do well by doing good
- Stress the win-wins
- Just transitions for those negatively affected
- Advanced notice
- **Inexorability**

## Some general principles:

- Start smart
- Do well by doing good
- Stress the win-wins
- Just transitions for those negatively affected
- Advanced notice
- Inexorability
- **Rewards for early adaptors**

Questions?

Comments??